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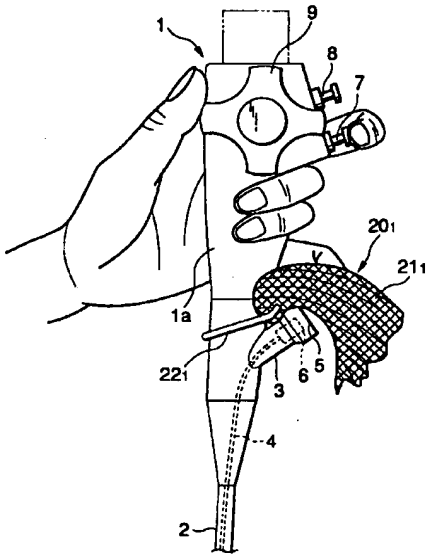
(54) Fluid splashing preventive device

(57) The invention concerns a foul fluid splashing prevention device for an endoscope, which prevents foul fluids inside the body cavity from splashing even when they spray out from a manipulating part side of the endoscope. The foul fluid splashing prevention device includes a foul fluid absorbing member made of flexible water-absorbing material for absorbing the foul fluids that leak out of an external opening of the endoscope. The splashing prevention device further includes a retaining member, which is detachably disposed at the manipulating part to retain the foul fluid absorbing member in the condition where the foul fluid absorbing member covers the external opening.

FIG.1



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Description

BACKGROUND OF THE INVENTION

The present invention relates to a fluid splashing preventiive device for endoscope which prevents the splashing of fluides, such as foul fluids, from an external opening that is provided at a manipulating part and is in communication with a fluid path, that opens at an inserted part. The present invetion is applicable to not only the endoscope itself but also an endoscope insertion guiding device that facilitates the insertion of the endoscope into deep parts of the large intestine or into the small intestine.

Generally with an endoscope, a forceps channel for passing through operative instruments extends through the inserted part. The front end exit of this forceps channel is opened at the front end of the inserted part and the base end entrance of this channel is opened at the manipulating part.

However, with the forceps channel as it is, the internal pressure of the body cavity can cause fluids, such as foul fluids inside the body cavity to pass through the forceps channel and escape from the entrance opening, thereby causing contamination of the operator and the surroundings.

Thus, in order to prevent the escape of such fluids while enabling the insertion and removal of operative instruments into and from the forceps channel, a so-called forceps plug, comprised for example of a rubber plug with a slit formed therein, is fitted to the entrance opening part of the forceps channel.

However, when an operative instrument is passed through the forceps plug, the slit of the rubber valve is spread, causing gaps to form between the rubber plug and the outer peripheral surface of the operative instrument at end portions of the slit, and in many cases, internal fluids are likely to escape from such portions. This problem is serious especially in the case of an operative instrument having a coil pipe as a sheath since such an operative instrument has spiral gaps at its outer peripheral surface.

Also, in the case of an operative instrument in which a manipulating wire, etc. is retractably inserted through a sheath, there is a gap between the sheath and the manipulating wire, and internal fluids can escape through this portion.

Furthermore, although the suction control valve and air/water conveying control valve disposed at the manipulating part are sealed by means of an O-ring fitted therein, foul body cavity fluids can escape from the leak port, etc. of the control valve when the O-ring becomes worn or damaged.

When fluids inside the body cavity escape from the operative instrument insertion entrance in the ways described above, the fluids can splash about onto the surroundings and onto the hands and face of the operator, thereby causing an extremely unsanitary condition to occur. However, it is difficult to prevent such escape of fluids from the inside of the body cavity completely.

The similar problem arises in case where an endoscope insertion guiding device is used in combination with the endoscope.

In many cases where an endoscope is simply inserted from the anus to perform endoscopy of the large intestine or small intestine, the sigmoid colon portion immediately ahead of the anus bends and thus hinders the insertion of the endoscope deeply. To cope with this difficulty, generally, an insertion guiding device called a sliding tube is used to shorten and straighten out the sigmoid colon.

Fig. 87 shows an example of a sliding tube 90. The sliding tube 90 is a somewhat flexible pipe-shaped object with a length of about 40cm. The sliding tube has such a thickness as to permit the insertion of the inserted part of an endoscope, and is provided with the proximal mouthpiece 91 slightly thicker for preventing entry inside the anus entirely.

Also, a sponge member 93, impregnated with lubricant and having a slit 92 formed at the center, is disposed inside the proximal mouthpiece 91, and the inserted part of the endoscope is made to pass through the sponge member 93 while spreading the slit (92) portion.

Fig. 88 shows the condition in which the sliding tube 90 is used to insert the inserted part 2 of the endoscope 1 into the large intestine from the anus of a patient.

As a general procedure, the sliding tube 90 is first put in the condition for straightening the colon portion using the inserted part 2 as a guide. The inserted part 2, which has been inserted through the sliding tube 90, is then pushed in deeper gradually while being pushed and pulled.

To insert the inserted part 2 into the large intestine in the above manner, the large intestine must be expanded to some degree by feeding air into the large intestine by means of an air conveying system provided in the endoscope. Thus the pressure inside the large intestine increases.

As a result, the air inside the large intestine blows out like flatus via the gap between the anus and the sliding tube 90 or the gap between the sliding tube 90 and the inserted part 2. Since the patient will be subject to great pain if the air from the inside of the large intestine is not expelled at this time, the expulsion of air from the inside of the intestine is unavoidable.

However, when air blows out from the anus part, the feces, that have become liquid-like upon being dissolved in purgative, etc., escape along with the air. When the air blows out, the slit (92) portion of sponge member 93 opens as shown in Fig. 89 and the air blows out instantaneously from this portion. Thus in many cases, the feces mixed with the air are scattered about over a wide range.

Also, as the inserted part 2 is pushed and pulled, the feces mixed with the lubricant are transferred from

the sponge member 93 to the pulled-out portion and contaminate the operator's hands. Likewise, the operator's hands also become dirty with feces when inserted part 2 is pulled out of the anus upon completion of endoscopy.

The operator himself will not have a problem since he usually wears rubber gloves in such cases. However, since the operator must touch equipment in the surroundings with the hands (gloves) that have been soiled thus with feces in many cases, such equipment in the surroundings become contaminated.

SUMMARY OF THE INVENTION

Thus, an object of the present invention is to present a fluid splashing prevention device for endoscope by which fluids inside the body cavity can be prevented from splashing even when they escape from the manipulating part side or the like of the endoscope, so that endoscopy can be performed in a sanitary manner.

In order to attain the above-noted and/or other object(s), the present invention provides a fluid splashing preventive device adapted for use with an endoscope. The endoscope defines an external opening which is in communication with a body cavity and through which fluids within the body cavity can escape The fluid splashing preventive device includes a retaining member provided to the endoscope, and a flexible, fluid absorbing member mountable onto the endoscope by the retaining member. The flexible, fluid absorbing member covering the external opening and absorbing the escaping fluids.

The present invention futher provides a fluid splashing preventive device for an endoscope having an insertion part and a manipulation part. The manipulation part has an external opening which is in communication with a body cavity through the insertion part. The fluid splashing preventive device includes a retaining member provided to the endoscope, and a first flexible, fluid absorbing member mountable onto the manipulation part in the vicinity of the external opening by the retaining member.

The present invention further provides a fluid splashing preventive device for a flexible, tubular endoscope insertion guiding device inserted into an opening in a body to guide an inserted part of an endoscope toward a body cavity. The guiding device has a proximal end through which the inserted part of the endoscope is inserted into an inside of the guiding device. The fluid splashing preventive device includes a retaining member provided to the proximal end, and a flexible, fluid absorbing member mountable onto the guiding device in the vicinity of the proximal end by the retaining member.

As an embodiment, a foul fluid splashing prevention device for an endoscope is provided, which prevents the splashing of foul fluids from an external opening that is provided at a manipulating part, connected to the base end of the inserted part of the endoscope, and is in communication with a fluid path, that opens at the inserted part. The foul fluid splashing prevention device for endoscope is made up of a foul fluid absorbing member made of flexible water-absorbing material for absorbing the foul fluids that leak out of the external opening at the outer side of the external opening and a retaining member, which is detachably disposed at the manipulating part to retain the foul fluid absorbing member in the condition where the foul fluid absorbing member covers the external opening from the outer side.

The material of the foul fluid absorbing member can be gauze, sponge, open-cell material, water-impregnatable non-woven fabric, or high molecular weight water-impregnatable polymer, and the retaining member can be a cord-like member that is passed through a cord path formed in the foul fluid absorbing member.

The retaining member can also be formed from a stretchable, endless member or can be formed from an end-to-end member having engaging parts at both ends that engage with each other. The retaining member can also be formed from an end-to-end member having engaging parts at both ends that engage with the manipulating part.

Furthermore, the foul fluid absorbing member can be formed so as to cover not only the external opening but a part of the grip portion of the manipulating part as well. The external opening may be an entrance for inserting an operative instrument into the forceps channel or a leak port formed on the control valve for conveying air or water or for performing suction.

With the embodiment of the present invention, since a foul fluid absorbing member, formed from a flexible, water-absorbing material, is attached to a position where it covers, from the outer side, an external opening provided at the manipulating part so as to be in communication with a fluid path that opens at the inserted part of the endoscope, foul fluids within the body cavity will be absorbed and prevented from splashing even when they escape from the external opening of the manipulating part, thus enabling endoscopy to be performed in a sanitary manner. Also, the foul fluid splashing prevention device can be readily attached, detached, or replaced whenever necessary.

As another embodiment, a foul fluid splashing prevention device for endoscope is provided, which is characterized in that a foul fluid absorbing member formed from a flexible water-absorbing material is detachably disposed at the outer surface portion of the manipulating part of an endoscope, and the foul fluid absorbing member is positioned so as to cover a forceps channel entrance provided near the manipulating part.

The foul fluid absorbing member may be made to be adhered onto the outer surface of the manipulating part, or the entrance portion of the forceps channel may be protruded from the manipulating part and a hole that engages with this protruded portion may be formed on the foul fluid absorbing member.

With the embodiment of the present invention, since a foul fluid absorbing member formed from a flexible water-absorbing material is detachably provided at the outer surface portion of the manipulating part of an endoscope and this foul fluid absorbing member is disposed so as to cover the entrance of the forceps channel, foul fluids within the body cavity are prevented from splashing outward from the entrance of the forceps channel, thus enabling endoscopy to be performed in a sanitary manner. Furthermore, the foul fluid splashing prevention device can be attached, detached, or replaced readily whenever necessary.

As another embodiment of the present invention, a foul fluid splashing prevention device for an endoscope is provided, which is characterized in that a foul fluid absorbing member, that is formed from flexible water-absorbing material and that is for covering an operative instrument insertion entrance disposed at the tip of a protrusion formed on the manipulating part of an endoscope, is retained in a detachably attached manner at the protrusion.

A forceps plug, which is substantially closed and which becomes open by an operative instrument upon the insertion of the operative instrument, can be detachably mounted to the operative instrument insertion entrance part, and the removal of the foul fluid absorbing member from the protrusion can be prevented by this forceps plug.

Also, a forceps plug, which is substantially closed and which becomes open by an operative instrument upon the insertion of the operative instrument, may be detachably mounted to the operative instrument insertion entrance part and a member for preventing the removal of the foul fluid absorbing member from the protrusion may be provided as a separate member from the forceps plug.

Furthermore, a hole into which the operative instrument insertion entrance part is inserted, may be formed in the foul fluid absorbing member, and a presser part for retaining the foul fluid absorbing member may be formed on the forceps plug or the abovementioned separate member and the foul fluid absorbing member may be sandwiched between the presser part and the manipulating part or the protrusion.

With the embodiment of the present invention, since a foul fluid absorbing member, which is formed from flexible water-absorbing material and is for covering the operative instrument insertion entrance of an endoscope, is provided, foul fluids within the body cavity are prevented from splashing outward from the operative instrument insertion entrance, thus enabling endoscopy to be performed in a sanitary manner. Also, the inserted part, etc. of the endoscope can be wiped with the foul fluid absorbing member immediately after the completion of endoscopy.

Furthermore, since the foul fluid absorbing member is detachably retained at a protrusion of the manipulating part at which the operative instrument insertion entrance is disposed, the foul fluid absorbing member can be readily replaced, etc. whenever necessary.

As another embodiment of the present invention, a foul fluid splashing prevention device for an endoscope is provided, which is characterized in that a foul fluid absorbing member, which is formed from flexible water-absorbing material and which is for covering an operative instrument insertion entrance disposed at the manipulating part of an endoscope, is mounted in a detachable and attachable manner near the operative instrument insertion entrance by means of pressure-sensitive adhesion.

The operative instrument insertion entrance may be disposed at the tip of a protrusion formed at the manipulating part and the foul fluid splashing absorbing member may be attached by pressure-sensitive adhesion to the outer peripheral surface of this protrusion.

Or, the operative instrument insertion entrance may be disposed at the tip of a protrusion formed at the manipulating part and the foul fluid splashing absorbing member may be attached by pressure-sensitive adhesion across the outer peripheral surface of the protrusion and the outer peripheral surface of the manipulating part.

The operative instrument insertion entrance may also be disposed at a flat portion of the manipulating part and the foul fluid absorbing member may be attached by pressure-sensitive adhesion to this flat portion.

With the embodiment of the present invention, since a foul fluid absorbing member, which is formed from flexible water-absorbing material and which is for covering an operative instrument insertion entrance disposed at the manipulating part of an endoscope, is mounted in a detachable and attachable manner near the operative instrument insertion entrance by means of pressure-sensitive adhesion, foul body cavity fluids are prevented from splashing out from the operative instrument insertion entrance, thus enabling endoscopy to be performed in a sanitary manner as well as enabling the foul fluid absorbing member to be reattached and replaced, etc. readily whenever necessary.

As another embodiment of the present invention, a contamination prevention device fastener for an endoscope is provided, which serves to attachably and detachably retain a foul fluid absorbing member formed of a flexible water absorbing material in a state where the outer wall surface near the operative tool insertion entrance of an endoscope is covered. The fastener is formed of an elastic material into a shape of a horseshoe-like cross section, and the fixed in a state where the outer wall surface of the endoscope is clamped from the outside by its own resiliency with the foul fluid absorbing member sandwiched between itself and the outer wall surface of the endoscope.

Furthermore, a pair of foul fluid absorbing members, i.e. the foul fluid absorbing member for covering the outer wall surface on the upper side of the operative

tool insertion entrance of the endoscope and the foul fluid absorbing member for covering the outer wall surface on the lower side thereof may be provided so as to be separately retained with independent fasteners.

Furthermore, the foul fluid absorbing member for covering the outer wall surface on the upper side of the operative tool insertion entrance of the endoscope and the foul fluid absorbing member for covering the outer wall surface on the lower side thereof may be provided so as to be retained with the same fastener. In this case, a opening to pass the operative tool insertion entrance portion of the endoscope therethrough may be provided in the midportion of the fastener.

Furthermore, a finger hook protrusion may be provided protrudingly on the outer surface, or a finger hook protrusion may be provided protrudingly in the halfway portion of the outer surface, or a finger hook protrusion may be provided protrudingly on the edge portion of the outer surface.

Furthermore, the edge portion in the axial direction of the fastener may be formed into a shape expanding outward or the edge portion in the axial direction may be formed partly protrudingly into a shape of an ear. In addition, the fastener may be formed symmetrical about the axial direction and a direction between which the axis is sandwiched.

With the embodiment of the present invention, a foul fluid absorbing member for absorbing foul fluids escaping from the operative tool insertion entrance can be readily attached to and detached from the outer wall portion of an endoscope, and thus it is possible to prevent foul fluids within a body cavity from splashing from the operative tool insertion entrance during endoscopy, and the absorbing member can be quickly removed for cleaning or disposal upon the termination of endoscopy. Therefore, very sanitary endoscopy can be achieved.

Furthermore, even when a foul fluid absorbing member is not mounted mistakenly at the start of endoscopy, it is possible to always mount the foul fluid absorbing member with ease as necessary without extracting the inserting portion inserted into the body cavity. When the contamination of the foul fluid absorbing member reaches a certain level on the way, it is possible to replace it with a new one with ease.

As another embodiment of the present invention, a foul fluid splashing prevention device for an endoscope is provided, which is characterized in that a foul fluid absorbing member, formed from flexible, water-absorbing material, is detachably and attachably disposed on the endoscope so as to cover the upper and lower outer wall faces in the vicinity of the operative instrument insertion entrance of the endoscope, and the foul fluid absorbing member is provided with a free end part that can be made to cover and uncover the operative instrument insertion entrance portion.

The foul fluid absorbing member may be formed as two separate parts, one part for covering the upper wall face in the vicinity of the operative instrument insertion entrance of the endoscope and the other for covering the lower wall face in the vicinity of the operative instrument insertion entrance of the endoscope. The free end part is provided at one of said parts.

The foul fluid absorbing member may also be formed in one piece as a whole. The operative instrument insertion entrance portion may be formed as a protrusion that protrudes from the outer wall face and a hole through which this protrusion is passed may be formed in the foul fluid absorbing member.

Also, a separate retaining member may be provided for detachably and attachably retaining the foul fluid absorbing member to the outer wall face, and this retaining member may be made from a resilient material and formed to have a cross sectional shape of a partially cut-out ring and the foul fluid absorbing member may be fixed to the outer wall face by pressing from the outer side.

With the embodiment of the present invention, foul fluids that escape from the operative instrument insertion entrance are first absorbed and prevented from splashing by a free end portion of a foul fluid absorbing member that covers the operative instrument insertion entrance portion, the fluids that splash or seep above the operative insertion entrance portion are absorbed by the upper portion of the foul fluid absorbing member, and the foul fluids that tend to drip downward are absorbed by the lower portion of the foul fluid absorbing member. Foul fluids within the body cavity are thus prevented from splashing from the operative instrument insertion entrance and endoscopy can be performed in a sanitary manner.

As another embodiment of the present invention, a foul fluid splashing prevention device for an endoscope is provided, which is characterized in that a foul fluid absorbing member formed from water-absorbing material is positioned to face a forceps plug entrance. The forceps plug entrance is disposed at the entrance end portion of a forceps channel in such a manner that it is substantially closed and becomes open by an inserted operative instrument. The water absorbing material is disposed so that the operative instrument can be passed therethrough while being in close contact with the interior of the foul fluid absorbing member. The foul fluid absorbing member may be formed from continuously foamed material (open-shell material). Also, the forceps plugs and a retaining member for the foul fluid absorbing member may be detachably mounted with respect to each other, or and the forceps plug and the retaining member for the foul fluid absorbing member may be provided as an integral unit.

The foul fluid absorbing member may be divided into and formed as a plurality of pieces so that the operative instrument to be inserted through the forceps plug is passed between the divided faces of the foul fluid absorbing member while spreading apart the divided faces, or the foul fluid absorbing member may be formed as a single block so that the operative instru-

ment to be inserted into the forceps plug is passed through the foul fluid absorbing member while piercing through the foul fluid absorbing member.

With the embodiment of the present invention, since a foul fluid absorbing member formed from water-absorbing material is positioned to face the entrance of a forceps plug disposed at the entrance end portion of a forceps channel in such a manner that an operative instrument can be passed through the foul fluid absorbing member while being in close contact with the interior of the foul fluid absorbing member, foul fluids within the body cavity can be absorbed even when they escape out from the forceps plug and thus prevented from splashing to thereby enable to perform endoscopy in a sanitary manner.

Another object of the present invention is to present a foul fluid splashing prevention device and/or a foul fluid splashing member fastener for an endoscope insertion guiding device that can significantly alleviate the contamination of the surroundings by feces when an endoscope is inserted into the large intestine from the anus and thereby enable to perform endoscopy in a sanitary manner.

To attain the above-noted and/or other objects, the present invention provides, as an embodiment, a foul fluid splashing prevention member fastener for an endoscope insertion guiding device. The fastener attachably and detachably retains a water-absorbing foul fluid absorbing member at the vicinity of the proximal portion of a flexible, pipe-like, endoscope insertion guiding device that is inserted from the anus into the colon to guide the inserted part of an endoscope. The fastener is made from resilient material and formed to have a horseshoe-like cross-sectional shape. The fastener is fixed by its own resilience in such a manner that it clamps the outer wall face of the insertion guiding device from the outer side while sandwiching the foul fluid absorbing member between itself and the outer wall face of the insertion guiding device.

The foul fluid absorbing material may be formed from a flexible material and may be a gauze-like member. Also, a protrusion that serves as a finger hook can be protruded from the outer face, and this finger hook protrusion may be protruded at an intermediate portion of the outer face or at an end portion of the outer face.

Furthermore, inward-directed protrusions for restricting the movement of the fastener in the axial direction of the insertion guiding device may be formed at the front and rear ends, or steps for restricting the movement of the fastener in the axial direction of the insertion guiding device may be formed at the insertion guiding device.

With the embodiment of the present invention, since a foul fluid absorbing member, for absorbing foul fluids that escape from the proximal portion of an insertion guiding device, can be readily attached to or detached from the insertion guiding device, foul fluids containing feces can be prevented from splashing from the proximal portion of the insertion guiding device during endoscopy, and the foul fluid absorbing member can be removed quickly for cleaning or disposal after the completion of endoscopy. Endoscopy can thus be performed in an extremely sanitary manner.

Furthermore, even if one forgets to attach the foul fluid absorbing member prior to the endoscopy, the foul fluid absorbing member can be attached readily whenever necessary without having to draw out of the body the inserted part that has been inserted into the body cavity, and the foul fluid absorbing member can be readily replaced with a new item when the contamination of the foul fluid absorbing member becomes severe during endoscopy.

As another embodiment of the present invention, a flexible, pipe-like, endoscope insertion guiding device is provided, which is inserted from the anus into the colon to guide the inserted part of an endoscope. The endoscope insertion guiding device is arranged such that a foul fluid absorbing member, with water-absorbing properties for absorbing foul fluids that escape from the root portion at the proximal side, is mounted in a detachable and attachable manner near the proximal portion.

The foul fluid absorbing member may be formed from flexible material and may be retained onto the outer peripheral surface of the proximal portion. The foul fluid absorbing member may be a gauze-like member.

The foul fluid absorbing member may also be fixed to the outer peripheral surface of the proximal portion by compression from the outer side by a resilient retaining member. This retaining member may be shaped to have a C-like, U-like, or laid-down U-like cross sectional shape.

With the embodiment of the present invention, since a foul fluid absorbing member, provided with water-absorbing properties for absorbing foul fluids that escape from the root portion at the proximal side, is detachably attached to a portion of an insertion guiding device near the proximal portion, the contamination of the surroundings by feces can be alleviated significantly during endoscopy in which an endoscope is inserted into the large intestine from the anus.

The present disclosure relates to subject matter contained in Japanese patent application Nos.:

8-223878 (filed on August 26, 1997);
8-223879 (filed on Augsut 26, 1996);
8-223880 (filed on August 26, 1996);
8-260368 (filed on October 1, 1996);
8-260369 (filed on October 1, 1996);
9-029913 (filed on February 14, 1997);
9-029914 (filed on February 14, 1997);
9-040192 (filed on February 25, 1997);
9-041723 (filed on February 26, 1997); and
9-177893 (filed on July 3, 1997),

which are expressly incorporated herein by refer-

ence in their entireties.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a side view which shows the condition in which a foul fluid splashing prevention device of a first embodiment of the present invention is attached to the manipulating part. Fig. 2 is a perspective view of the foul fluid splashing prevention device of the first embodiment of the present invention.

Fig. 3 is a partial front view which shows the condition in which an operative instrument is used with the foul fluid splashing prevention device of the first embodiment of the present invention being attached to the manipulating part. Fig. 4 is a side view which shows a different condition of use of the foul fluid splashing prevention device of the first embodiment of the present invention.

Fig. 5 is a front view of a foul fluid splashing prevention device of a second embodiment of the present invention.

Fig. 6 is a front view of a foul fluid splashing prevention device of a third embodiment of the present invention. Fig. 7 is a side view which shows the condition in which the foul fluid splashing prevention device of the third embodiment of the present invention is attached to the manipulating part.

Fig. 8 is a side view which shows the condition in which the foul fluid splashing prevention device of the third embodiment of the present invention is attached to the manipulating part in a different manner.

Fig. 9 is a perspective view of a foul fluid splashing prevention device of a fourth embodiment of the present invention.

Fig. 10 is a schematic sectional plan view which shows the condition in which the foul fluid splashing prevention device of the fourth embodiment of the present invention is attached to the manipulating part.

Fig. 11 is a plan view partly in section which shows the condition in which a foul fluid splashing prevention device of a fifth embodiment of the present invention is attached to the manipulating part.

Fig. 12 is a side view which shows the condition in which the foul fluid splashing prevention device of the fifth embodiment of the present invention is attached to the manipulating part.

Fig. 13 is a side view which shows the usage condition in which a foul fluid splashing prevention device of a sixth embodiment of the present invention is attached to the manipulating part.

Fig. 14 is a perspective view of the foul fluid splashing prevention device of the sixth embodiment of the present invention.

Fig. 15 is a cross section along line 15-15 of the foul fluid splashing prevention device of the sixth embodiment of the present invention.

Fig. 16 is a side view which shows a different usage condition in which the foul fluid splashing prevention device of the sixth embodiment of the present invention is attached to the manipulating part.

Fig. 17 is a front view of a foul fluid splashing prevention device of a seventh embodiment of the present invention.

Fig. 18 is a perspective view of the retainting member of the foul fluid splashing prevention device of the seventh embodiment of the present invention.

Fig. 19 is a side view which shows the usage condition in which the foul fluid splashing prevention device of the seventh embodiment of the present invention is attached to the manipulating part.

Fig. 20 is a front view of a foul fluid splashing prevention device of an eigth embodiment of the present invention.

Fig. 21 is a rear view of the foul fluid splashing prevention device of the eighth embodiment of the present invention.

Fig. 22 is a cross section along line 22-22 of Fig. 20.

Fig. 23 is a partial side view which shows the usage condition in which the foul fluid splashing prevention device of the eighth embodiment of the present invention is attached to the manipulating part.

Fig. 24 is a side view which shows the condition in which an operative instrument is used with the foul fluid splashing prevention device of the eighth embodiment of the present invention being attached to the manipulating part.

Fig. 25 is a front view of a foul fluid splashing prevention device of a ninth embodiment of the present invention. Fig. 26 is a side view partly in section which shows the usage condition in which the foul fluid splashing prevention device of the ninth embodiment of the present invention is attached to the manipulating part.

Fig. 27 is a sectional side view which shows the usage condition in which a foul fluid splashing prevention device of a tenth embodiment of the present invention is mounted to the manipulating part.

Fig. 28 is a perspective view of the foul fluid splashing prevention device of the tenth embodiment of the present invention.

Fig. 29 is a perspective view of a foul fluid splashing prevention device of an eleventh embodiment of the present invention.

Fig. 30 is a side view partly in section which shows the usage condition in which the foul fluid splashing prevention device of the eleventh embodiment of the present invention is mounted to the manipulating part.

Fig. 31 is a sectional side view which shows the usage condition in which a foul fluid splashing prevention device of a twelfth embodiment of the present invention is mounted to the manipulating part.

Fig. 32 is a sectional side view which shows the usage condition in which a foul fluid splashing prevention device of a thirteenth embodiment of the present invention is mounted to the manipulating part.

Fig. 33 is a perspective view of a part of the foul fluid splashing prevention device of the thirteenth

embodiment of the present invention.

Fig. 34 is a sectional side view which shows the usage condition in which a foul fluid splashing prevention device of a fourteenth embodiment of the present invention is mounted to the manipulating part.

Fig. 35 is a side view which illustrates the usage condition in which a foul fluid splashing prevention device of a fifteenth embodiment of the present invention is attached to the manipulating part.

Fig. 36 is a front view of the foul fluid splashing prevention device of the fifteenth embodiment of the present invention.

Fig. 37 is a perspective view which illustrates the first usage condition of the foul fluid splashing prevention device of the fifteenth embodiment of the present invention.

Fig. 38 is a side view which illustrates the usage condition in which an operative instrument is used with the foul fluid splashing prevention device of the fifteenth embodiment of the present invention being attached to the manipulating part. Fig. 39 is a side view which illustrates the usage condition in which a foul fluid splashing prevention device of a sixteenth embodiment of the present invention is attached to the manipulating part.

Fig. 40 is a perspective view which illustrates the usage condition of the foul fluid splashing prevention device of the sixteenth embodiment of the present invention.

Fig. 41 is a side view which illustrates the usage condition in which the foul fluid splashing prevention device of the sixteenth embodiment of the present invention is attached to the manipulating part.

Fig. 42 is a side view which illustrates the usage condition in which an operative instrument is used with the foul fluid splashing prevention device of the sixteenth embodiment of the present invention being attached to the manipulating part.

Fig. 43 is a transverse cross-sectional view which illustrates the usage condition in which an operative instrument is used with the foul fluid splashing prevention device of the sixteenth embodiment of the present invention being attached to the manipulating part.

Fig. 44 is a side view which illustrates the usage condition in which the foul fluid splashing prevention device of the sixteenth embodiment of the present invention is attached to the manipulating part.

Fig. 45 is a front view of a foul fluid splashing prevention device of a seventeenth embodiment of the present invention.

Fig. 46 is a side view of the usage condition in which a foul fluid splashing prevention device of an eighteenth embodiment of the present invention is attached to the manipulating part.

Fig. 47 is a side view of the usage condition in which a foul fluid prevention device of a nineteenth embodiment of the present invention is attached to the manipulating part.

Fig. 48 is a perspective view of a fastener in the nineteenth embodiment of the present invention.

Fig. 49 is a plan sectional view of a portion where the fastener in the nineteenth embodiment of the present invention is mounted on the operating part.

Fig. 50 is a plan view showing with a section part of a state where the fastener in the nineteenth embodiment of the present invention is mounted on the operating part.

Fig. 51 is a plan view showing with a section part of a state where the fastener in the nineteenth embodiment of the present invention is removed from the operating part.

Fig. 52 is a sectional view of a fastener in a twentieth embodiment of the present invention.

Fig. 53 is a sectional view of a fastener in a twinty-first embodiment of the present invention.

Fig. 54 is a side view of an application state of a fastener in a twenty-second embodiment of the present invention where it is mounted on the manipulating part.

Fig. 55 is a perspective view of the fastener in the twenty-second embodiment of the present invention.

Fig. 56 is a perspective view of a fastener in a twenty-third embodiment of the present invention.

Fig. 57 is a perspective view of the fastener in a twenty-fourth embodiment of the present invention.

Fig. 58 is a front view of the fastener in the twenty-fourth embodiment of the present invention.

Fig. 59 is a sectional view of a material of the fastener in the twenty-fourth embodiment of the present invention.

Fig. 60 is a side view of an application state of a fastener in a twenty-fifth embodiment of the present invention where it is mounted on the manipulating part.

Fig. 61 is a perspective view of the fastener in the twenty-fifth embodiment of the present invention.

Fig. 62 is a side view of the usage condition in which a foul fluid splashing prevention device of a twenty-sixth embodiment of the present invention is attached to the manipulating part.

Fig. 63 is a side view which shows the usage condition in which a foul fluid splashing prevention device of a twenty-seventh embodiment of the present invention is attached to the sliding tube.

Fig. 64 is a cross sectional view taken along line 64-64 of Fig. 63.

Fig. 65 is a sectional side view of the sliding tube. Fig. 66 is a partially enlarged sectional side view of the sliding tube.

Fig. 67 is a schematic view which shows the usage condition of the twenty-seventh embodiment of the present invention.

Fig. 68 is a side view which shows the usage condition in which a foul fluid splasing prevention device of a twenty-eighth embodiment of the present invention is attached to the sliding tube.

Fig. 69 is a cross sectional view taken along line 69-69 of Fig. 68.

Fig. 70 is a front view of the fastener in the twenty-

eighth embodiment of the present invention.

Fig. 71 is a side view which shows the usage condition in which a foul fluid splashing prevention device of a twenty-ninth embodiment of the present invention is attached to the sliding tube.

Fig. 72 is a cross sectional view taken along line 72-72 of Fig. 71.

Fig. 73 is a front view of the fastener in the twenty-ninth embodiment of the present invention.

Fig. 74 is a side view which shows the usage condition in which a foul fluid splashing prevention device of a thirtieth embodiment of the present invention is attached to the sliding tube.

Fig. 75 is a cross sectional view taken along line 75-75 of Fig. 74.

Fig. 76 is a side view which shows the usage condition in which a foul fluid splashing prevention device of a thirty-first embodiment of the present invention is attached to the sliding tube.

Fig. 77 is a cross sectional view taken along line 77-77 of Fig. 76.

Fig. 78 is a side view which shows the usage condition in which a foul fluid splashing prevention device of a thirty-second embodiment of the present invention is attached to the sliding tube.

Fig. 79 is a perspective view of the retaining ring in the thirth-second embodiment of the present invention.

Fig. 80 is a developed view of a foul fluid splashing prevention device of a thirty-third embodiment of the present invention.

Fig. 81 is a side view of the usage condition in which the foul fluid splashing prevention device of the thirty-third embodiment of the present invention is attached to the sliding tube.

Fig. 82 is a longitudinal section view of a foul fluid splashing prevention device of a thirty-fourth embodiment of the present invention.

Fig. 83 is a perspective view of a foul fluid absorbing member in the thirty-fourth embodiment of the present invention.

Fig. 84 is a side view partly in section of the manipulating part of the endoscope in the thirty-fourth embodiment of the present invention.

Fig. 85 is a longitudinal sectional view of a foul fluid splashing prevention device of a thirty-fifth embodiment of the present invention.

Fig. 86 is a longitudinal sectional view of a foul fluid splashing prevention device of a thirty-sixth embodiment of the present invention.

Fig. 87 is a sectional side view of an example of sliding tube.

Fig. 88 is a perspective view which shows the usage condition of the sliding tube.

Fig. 89 is a perspective view which shows the condition in which air and foul fluids escape from the sponge member portion of the sliding tube.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the present invention will now be described with reference to the drawings.

In Fig. 1, reference numeral 1 designates a manipulating part of an endoscope, and an inserted part 2, which is to be inserted into the body cavity, is connected to the lower end portion of this manipulating part 1.

A forceps channel 4, which opens out at the front end, is passed through the entire length of inserted part 2. The base end side of the forceps channel 4 is in communication with an operative instrument insertion entrance 5, which is opened at the tip of a protrusion 3 protruded obliquely upwards from the lower end portion of the manipulating part 1.

Inside protrusion 3, a forceps plug 6 is disposed adjacent the inner side of the operative instrument insertion entrance 5, which is generally closed but forced to open by insertion of an operative instrument into forceps channel 4 from the operative tool insertion entrance 5.

At the upper half portion of manipulating part 1, an air/water conveying control valve 7 and a suction control valve 8 are disposed at the front face side and a curvature manipulating knob 9, for remote manipulation of the bending of a curved part (not shown) formed near the front end of inserted part 2, is disposed at the side face. A grip part 1a is formed between this portion and the lower end portion of manipulating part 1.

Although an air conveying tube and a water conveying tube, that are opened at the front end of the inserted part 2, are connected in communication with the air/water conveying control valve 7, these tubes are not illustrated. Also, the suction control valve 8 is connected in communication with the forceps channel 4 at the lower end portion of the manipulating part 1 with forceps channel 4 serving in common as a suction channel.

Reference numeral 20_1 designates a foul fluid splashing prevention device for endoscope. As shown in Fig. 2, a plurality of sheets of water absorbing material, for example flexible gauze, are overlapped and folded over to form a foul fluid absorbing member 21_1, and a retaining member 22_1, made for example from a rubber band, etc. is engaged with the folded-over part of the absorbing member 21_1.

In this embodiment, foul fluid absorbing member 21_1 is sewn parallel to the fold line near the folded part to form a pass-through hole 23_1 for letting the retaining member 22_1 pass therethrough. The reference numeral 24_1 designates the seam.

Although the foul fluid absorbing member 21_1 may simply be folded instead of forming such a pass-through hole 23_1, the pass-through hole 23_1 eases the attachment/detachment, etc. of the preventive member 20_1 to the manipulating part 1 since the retaining member 22_1 is attached in a stable manner to the foul fluid absorbing member 21_1.

The foul fluid splashing prevention device 20_1 thus constructed is fixed by passing the inserted part 2 of the endoscope through the retaining member 22_1 and binding to a lower end portion of manipulating part 1 by means of the retaining member 22_1 as shown in Fig. 1. The diameter of the retaining member 22_1 is set according to the thickness of the manipulating part 1.

In this embodiment, the retaining member 22_1 is fixed at a portion above the protrusion 3 so that the foul fluid absorbing member 21 covers the outer surface of the operative instrument insertion entrance 5 from the upper side.

In this condition, the foul fluid absorbing member 21_1 can be held by being lightly pressed by the small finger of the operator's hand that grips the grip part 1a as shown in Fig. 1, and even if foul fluids in the body cavity passing through forceps channel 4 escapes outward from the operative instrument insertion entrance 5, the fluids can be absorbed by the foul fluid absorbing member 21_1 and can not splash about or get on the hands or face of the operator.

In case where an operative instrument is used upon inserting it through the forceps channel 4 from the operative instrument insertion entrance 5, the splashing of foul fluid can be prevented by surrounding the periphery of the operative instrument 100 with the foul fluid absorbing member 21_1 as shown in Fig. 3.

Also, by covering the grip part 1a of the manipulating part 1 using a half of the foul fluid absorbing member 21_1 and grasping the foul fluid absorbing member 21_1 with the hand that holds grip part 1a as shown in Fig. 4, the foul fluids can be prevented from flowing to the hand, the manipulating part 1 can be held securely without slippage, and the foul fluid absorbing member 21_1 can be held in a stable manner.

As shown in Fig. 5, the material of the foul fluid absorbing member is not limited to a gauze and a wide variety of flexible, water-absorbing materials, such as sponge, open-cell material, water-impregnatable nonwoven fabric, high molecular weight water-impregnatable polymer, etc., can be used (21_2, Fig. 5). Also, a solvent weld, etc. can be used in place of the seam (24_2) portion for forming the pass-through hole 23_2.

Also, an end-to-end cord-like member 22_3 can be used for the retaining member for example as shown in Fig. 6 and, a Swedish fastener or a hook-and-loop fastener (so-called Velcro tape [trademark]) 22_3a, etc. can be provided at both ends so that the end portions can be engaged with each other.

Fig. 7 shows the condition where the embodiment shown in Fig. 6 is used, and with this embodiment, the detachment and attachment of the preventive device 20_3 to the manipulating part 1 can be performed more readily in comparison to the case where a rubber band is used. Also, as shown in Fig. 8, the retaining member 22_3 can be fixed to the manipulating part 1 at a position below the protrusion 3 so that the absorbing member covers the outer surface of the operative instrument insertion entrance 5 from the lower side.

In this case, since the end portion 21_3a of the foul fluid absorbing member 21_3 is lowered by gravity to a position at which it covers the surface of operative instrument insertion entrance 5, the splashing of foul fluid from the operative instrument insertion entrance 5 can be prevented positively.

Figs. 9 and 10 illustrate an embodiment in which retaining rings 22_4b are formed at the ends of the retaining member 22_4, and the retaining rings 22_4b at both ends are hooked and retained on the protrusion 3 under the condition that the retaining member 22_4 is wound around the lower end portion of the operating part 1. The attachment and detachment of foul fluid splashing prevention device 20_4 to and from manipulating part 1 is thus facilitated. It is preferable to use a resilient material for the retaining member 22_4.

Figs. 11 and 12 illustrate an embodiment in which foul fluid splashing prevention device 20_5 is attached to the upper half portion of the manipulating part 1 so that the outer surfaces of the air/water conveying control valve 7 and the suction control valve 8 are covered with the foul fluid absorbing member 21_5.

In this case, the foul fluid that splashes from the leak port, etc., formed on the air/water conveying control valve 7 or suction control valve 8, can be absorbed even when the O-rings fitted to valves 7 and 8 become damaged, etc.

Figs. 13 to 16 illustrate an embodiment in which a pressure-sensitive adhesive material is used as the retaining member. As similarly to the former embodiments, a foul fluid absorbing member 21_6 is formed by folding over and overlapping a plurality of sheets of the water-absorbing material, such as flexible gauze, etc. The central portion of this foul fluid absorbing member 21_6 is sewn with thread to prevent it from spreading.

As illustrated in Fig. 15 which shows a cross section along the thread (24_6) portion, a retaining member 122_6, which is for retaining the foul fluid splashing prevention device 20_6 to the manipulating part 1 and is formed from a pressure-sensitive adhesive material, such as a double-coated adhesive tape, is adhered onto the surface of the foul fluid absorbing member 21_6 along the portion sewn by thread 24_6.

As shown in Fig. 15, a protective sheet 25_6, which can be readily peeled off from double-coated adhesive tape 122_6, is attached to the surface of the adhesive tape 122_6 at the side which is to be adhered onto the manipulating part 1. This protective sheet 25_6 is to be peeled off immediately prior to attaching the adhesive tape 122_6 onto the manipulating part 1.

In use, the protective sheet 25_6 is removed, and the retaining member 122_6 is then adhered onto the front outer surface immediately above the protrusion 3 of the manipulating part 1 so that the operative instrument insertion entrance (5) portion is covered with a half of the foul fluid absorbing member 21_6 as shown in Fig. 13.

As shown in Fig. 16, the foul fluid absorbing member 21_6 may be positioned so that the halves at both sides can cover the operative instrument insertion entrance 5. In this case, the foul fluid absorbing member 21_6 can be held by being lightly pressed by the small finger of the operator's hand that grips grip part 1a, so that the absorption of foul fluids that leak out from the operative instrument insertion entrance 5 can be enhanced.

Figs. 17 and 18 show another embodiment of the present invention in which a single-coated adhesive tape is used as the retaining member. The retaining member 122_7 of this embodiment is folded as shown in Fig. 18 in the condition prior to use.

In use, the non-adhesive tab part 26_7 formed at the tip is pulled outward to draw out the retaining member 122_7 so that it can be adhered onto the outer surface of the manipulating part 1 as shown in Fig. 19.

Although a half of the foul fluid absorbing member 21_7 is set along and held together with the grip part 1a of the manipulating part 1 in Fig. 19, the operative instrument insertion entrance 5 may, of course, be covered with the halves of the foul fluid absorbing member 21_7 at both sides.

Figs. 20 to 24 show another embodiment of the present invention. As illustrated in Fig. 22 which shows the section along line 22-22 of Fig. 20, a water-absorbing cloth (or non-woven fabric) 21_8a, that serves as the foul fluid absorbing member, is provided in its interior with a substance 21_8b (for example, a high molecular weight water-impregnatable polymer) having higher water absorbing properties than cloth 21_8a. As shown in Fig. 21, the rear surface of the cloth 21_8a is provided with a waterproof cloth (or paper) 28_8.

As shown in Fig. 20, the cloth 21_8a has a double-coated adhesive tape adhered onto its front surface side as the retaining member 122_8, and in use the retaining member 122_8 is attached to the outer surface of a portion of the manipulating part 1 immediately above the protrusion 3 as shown in Fig. 23.

Thus, as shown in Fig. 23, this embodiment also enables to cover the operative instrument insertion entrance 5 with the foul fluid absorbing member 21_8, and during the use of the operative instrument, the operative instrument 100 that is inserted into operative instrument insertion entrance 5 can be covered with the foul fluid absorbing member 21_8 from the upper side as shown in Fig. 24.

Figs. 25 and 26 show another embodiment of the present invention in which a hole, that is adapted to engage with the protrusion 3 of the manipulating part 1, is bored in the foul fluid absorbing member 21_9 to serve as the retaining member 222_9. Fig. 25 is a front view of the foul fluid splashing prevention device 20_9 and Fig. 26 shows the usage condition in which the protruded part 3 is passed through hole 222_9. As is clear from this embodiment, any means can be used as the retaining member as long as it can retain the foul fluid absorbing member onto the manipulating part 1.

In case where the hole 222 adapted to engage the protruded part 3 of the manipulating part 1 is formed in the foul fluid absorbing member, the following arrangements are conceivable as additional means for more positively retaining the preventive device onto the manipulating part 1.

As shown in Fig. 27, a resilient, rubber forceps plug 322_{10} is detachably mounted to the end half of an insertion mouth 10. A flange-like stepped portion 10a is formed at the protruding end portion of the insertion mouthpiece 10, and an engaging hole 322_{10}b that is matched in shape with this stepped portion 10a is formed in the forceps plug 322_{10}.

Thus, when the forceps plug 322_{10} is forced against the insertion mouthpiece 10 with the application of a slightly strong force so that the insertion mouthpiece 10 is fitted into the engaging hole 322_{10}b of forceps plug 322_{10}, the forceps plug 322_{10} elastically deforms to cover the insertion mouthpiece 10, so that the forceps plug 322_{10} is attached to the insertion mouthpiece 10 in a stable manner with the stepped portion at its tip preventing the removal of the forceps plug 322_{10} as shown in Fig. 27. In addition, if the forceps plug 322_{10} is pinched with the fingertips, etc. and a slightly strong twisting force is applied thereto, the forceps plug 322_{10} can be removed from the insertion mouthpiece 10 while undergoing elastic deformation.

In the condition where the forceps plug 322_{10} is attached to the insertion mouthpiece 10, the central portion of the forceps plug 322_{10} depressingly fits into the inside of the mouth of the insertion mouthpiece 10 (in other words, the inside of the operative instrument insertion entrance 5), and thus the operative instrument insertion entrance 5 is thereby sealed.

A slit 12, which is generally closed, is formed at the central portion of the forceps plug 322_{10}. The slit 12 is formed at the bottom of a tapered hole that spreads gradually outward, and the outer end portion of this tapered hole serves as the operative instrument insertion entrance 15 of forceps plug 322_{10}. Unillustrated operative instruments are passed through the slit 12 upon being inserted via this tapered hole.

When an operative instrument is inserted, the slit 12 undergoes elastic deformation and spreads, and the tip of the operative instrument is passed inside the forceps channel 4 and extended towards the affected part from an unillustrated front end exit.

As shown in Fig. 28, the foul fluid splashing prevention device 20_{10} includes a foul fluid absorbing member 21_{10} made of a water-absorbing material such as flexible gauze, high molecular weight water-impregnatable polymer, hydrophilic non-woven cloth, etc., which has, at its central portion, a mounting hole 222_{10}, of a diameter that permits the insertion mouthpiece 10 to be inserted loosely. When the endoscope is to be used, the insertion mouthpiece 10 is inserted into the mounting hole 222_{10} and the forceps plug 322_{10} is thereafter attached to the tip of the insertion mouthpiece 10 as

shown in Fig. 27.

Since the forceps plug 322_{10} is mounted to the insertion mouthpiece 10 in a capping manner, the foul fluid splashing prevention device 20_{10} is retained and positively prevented from being removed from the insertion mouthpiece 10.

A flange 322_{10}a is protruded from the bottom portion of the forceps 322_{10} that faces the foul fluid absorbing member 21_{10} so as to retain the foul fluid absorbing member 21_{10} in a stable manner over a wide area.

To remove the foul fluid splashing prevention device 20_{10} from the manipulating part 1, the forceps plug 322_{10} is removed simply from the insertion mouthpiece 10. The foul fluid splashing prevention device 20_{10} can thus be mounted securely and in a stable manner to the manipulating part 1 and can also be readily detached from the manipulating part 1.

With the foul fluid splashing prevention device 20_{10} that is mounted to the insertion mouthpiece 10, a half portion of the foul fluid absorbing member 21_{10} is folded back in a U-turn like manner and made to cover the operative instrument insertion entrance 15 part of the forceps plug 322_{10}.

Figs. 29 and 30 show another embodiment of the present invention in which a mounting hole 222_{11} is disposed not at the center of the foul fluid absorbing member 21_{11} but offset towards the side as similarly to the embodiment shown in Figs. 25 and 26, and the mounting hole 222_{11} is engaged with the protrusion 3 of the manipulating part 1 and then the forceps plug 322_{11} is mounted above the foul fluid absorbing member 21_{11} to the protrusion 3 in a covering manner. The longitudinal side of the foul fluid absorbing member 21_{11} is disposed so as to cover the operative instrument insertion entrance 15 of the forceps plug 322_{11} from above.

If the covering of the operative instrument insertion entrance 15 by the foul fluid splashing prevention device 20_{11} causes a hindrance, the foul fluid absorbing member 21_{11} can be gripped along with the grip part 1a of the manipulating part 1 as shown by the dashed line of Fig. 30.

Fig. 31 shows another embodiment of the present invention in which the flange 322_{12}a of the forceps plug 322_{12} that depressingly retains foul fluid absorbing member 21_{12} is made large so that foul the fluid splashing prevention device 20_{12} can be retained more firmly.

Figs. 32 and 33 show another embodiment of the present invention in which an alligator-tail-like tail part 322_{13}c is formed on the forceps plug 322_{13} which is mounted to the insertion mouthpiece 10 at the tip of the protrusion 3, and the foul fluid absorbing member 21_{13} is retained by being clamped between this tail part 322_{13}c and the surface of manipulating part 1. In this case, there is no need to form a mounting hole in the foul fluid absorbing member 21_{13} as shown in Fig. 33.

Fig. 34 shows another embodiment of the present invention in which a mounting hole 222_{14} is formed in the foul fluid absorbing member 21_{14}. This mounting hole 222_{14} is engaged with the protrusion 3 of the manipulating part 1, and the foul fluid absorbing member 21_{14} is held in place by a presser member 422_{14} provided as a separate member from a forceps plug 11 and mounted above the absorbing member 21_{14}.

The presser member 422_{14} is made from resilient rubber and can be elastically deformed and thus readily attached to and detached from a flange part 18 protruded from the protrusion 3 without removable of the forceps plug 1. The foul fluid splashing prevention device 20_{14} can thus be replaced readily even during endoscopy.

Figs. 35 and 38 show another embodiment of the present invention. As shown in Fig. 36, a rectangular, sheet-form, foul fluid absorbing member 21_{15} is formed by folding over and overlapping a plurality of sheets of water-absorbing material, such as flexible gauze. A pressure-sensitive adhesive surface 122_{15} is formed near one of the short sides of the foul fluid absorbing member 21_{15}.

The pressure-sensitive surface 122_{15} undergoes hardly any deterioration under normal environments and is adhered by pressure-application onto the surface to which it is intended to be attached. Note that the force of adhesion onto a plastic or metal surface, etc. is not strong and the pressure-sensitive adhesive surface 122_{15} can be detached therefrom by applying a slightly strong force.

The foul fluid absorbing member 21_{15} is machine sewn at both sides of the pressure-sensitive adhesive surface 122_{15}. Reference numeral 24_{15} designates the machine-sewn seam. The material of the foul fluid absorbing member 21_{15} is not limited to a gauze and a wide variety of flexible, water-absorbing materials, such as sponge, non-woven fabric, high molecular weight water-impregnatable polymer, or an open cell material such as PVA sponge, etc., can be used.

The foul fluid splashing prevention device 20_{15}, that has been formed in the above manner, is attached to the manipulating part 1 with the pressure-sensitive adhesive surface 122_{15} being pressed against and adhered onto the lower-end outer peripheral surface of the protrusion 3.

Fig. 37 shows exclusively the foul fluid splashing prevention device 20_{15} in this condition. The pressure-sensitive adhesive surface (122_{15}) portion presents a U-like form extending along nearly half the circumference of the outer peripheral surface of the protrusion 3 and the foul fluid absorbing member 21_{15} is oriented upwards.

As shown in Fig. 35, the foul fluid absorbing member 21_{15} is disposed so as to cover the operative instrument insertion entrance 5 at the tip portion of the protrusion 3.

When an operative instrument is to be inserted into the forceps channel 4, the foul fluid absorbing member 21_{15} that is covering the operative instrument insertion entrance 5 is made to present a slightly open U-like

shape as shown in Fig. 38 and the operative instrument 100 is inserted into the forceps channel 4 from the operative instrument insertion entrance 5.

Fig. 39 illustrates the case where the width of the foul fluid absorbing member 21_{16} is widened and the pressure-sensitive adhesive surface 122_{16} is adhered onto an area extending from the outer peripheral surface of the protrusion 3 to the outer peripheral surface of the base side of the manipulating part 1. In this case, the foul fluid splashing prevention device 20_{16} can be adhered in a more stable manner. Fig. 40 shows exclusively the foul fluid splashing prevention device in this condition.

Fig. 41 illustrates the case where the foul fluid absorbing member 21_{16} is attached across the entire circumference of the outer peripheral surface of protrusion 3. In this case, since pressure-sensitive adhesive surface 122_{16} is adhered onto the outer peripheral surface of the protrusion 3 in a band-like manner, the foul fluid splashing prevention device 20_{16} can be adhered in an even more stable condition.

Fig. 42 shows the condition in which the operative instrument 100 is used in the case where the foul fluid splashing prevention device 20_{16} is attached to the manipulating part 1 in the above manner, and as shown by the transverse cross section in Fig. 43, the operative instrument 100 is passed through the internal space part formed by the foul fluid absorbing member 21_{16} formed into a tubular shape.

Fig. 44 illustrates the case where the operative instrument insertion entrance 5' is disposed at a flat portion of the manipulating part 1. In this case, the pressure-sensitive adhesive surface 122_{16} is adhered onto the flat portion adjacent the operative instrument insertion entrance 5' so that the foul fluid absorbing member 21_{16} covers the operative insertion entrance 5'.

When the operative instrument 100 is to be used, the foul fluid absorbing member 21_{16} is withdrawn from the operative instrument insertion entrance 5'. Alternatively, a slit 30 may be formed at the portion of the foul fluid absorbing member 21_{17} that faces the operative insertion entrance 5' as shown in Fig. 45 so that the operative instrument 100 can be passed through this slit 30.

Fig. 46 shows the condition in which a pair of foul fluid absorbing members 21_{18}a and 21_{18}b are attached to the manipulating part 2. That is, the upper foul fluid absorbing member 21_{18}a and lower foul fluid absorbing member 21_{18}b are respectively adhered onto the outer wall face of manipulating part 2 by pressure-sensitive adhesive agents 122_{18}.

So-called double-coated adhesive tape, etc. can be used as the pressure-sensitive adhesive agent 122_{18}, and when endoscopy is ended, the foul fluid absorbing member 21_{18} is peeled off from the surface of manipulating part 2 and can be replaced with a new item.

Fig. 47 shows another embodiment in which the foul fluid absorbing member 21_{19} is attached to the manipulating part 1 by separate retaining members 522_{19}.

The foul fluid absorbing member 21_{19} includes an upper foul fluid absorbing member 21_{19}a, that covers the outer wall face of the manipulating part 1 at the upper side in the vicinity of the operative instrument insertion entrance 5, and a lower foul fluid absorbing member 21_{19}b, that covers the outer wall face of the manipulating part 2 at the lower side in the vicinity of the operative instrument insertion entrance 5.

Both the upper foul fluid absorbing member 21_{19}a and the lower foul fluid absorbing member 21_{19}b are attached to cover the outer wall face of the manipulating part 1 over an area extending from the front side to the left and right sides.

Each of the upper side foul fluid absorbing member 21_{19}a and the lower side foul fluid absorbing member 21_{19}b is detachably retained separately and independently on the manipulating part 1 with a retaining member (fastener) 522_{19} made of elastic material such as a metal having spring property and a hard plastic (e.g., nylon, derlin, Teflon, polysulfone and polyimidamide, etc.).

The fastener (retaining member) 522_{19} is formed into an almost horseshoe-like shape (or C-shaped) in section as shown in Fig. 48. As shown in Fig. 49, the fastener 522_{19} is set into such a geometry as to clamp from the outer wall surface of the manipulating part 1 by its own resiliency with the foul fluid absorbing member 21_{19} sandwiched between the outer wall surface of the manipulating part 1 and the fastener 522_{19}. Both opened edge portions 522_{19}a of the fastener are spreaded smoothly and slightly outward to prevent the foul fluid absorbing member 21_{19} from being caught thereby.

A pair of projections 13_{19} for finger hooks are protrudingly formed laterally in the halfway portions of the outer surface of the fastener 522_{19} so as to facilitate hooking of the finger when the fastener 522_{19} is attached to and detached from the manipulating part 1.

When the fastener 522_{19} is to be attached, as shown in Fig. 50, while applying the foul fluid absorbing member 21_{19} to the outer wall surface of the manipulating part 1 the fastener 522_{19} is pressed almost vertically to the axis of the manipulating part 1 from the outside. Then, the fastener 522_{19} is subjected to elastic deformation and covers the foul fluid absorbing member 21_{19} while expanding. At this time, the fingertips are caught by the protrusions 13_{19} and thus prevented from slipping.

Then, when the fastener 522_{19} covers the foul fluid absorbing member 21_{19} as shown in Fig. 49, the foul fluid absorbing member 21_{19} is pressed inwardly to the outer wall surface of the manipulating part 1 and retained in place by the fastener 522_{19} having the resiliency (spring force) to contract to its original shape.

When the foul fluid absorbing member 21_{19} is to be removed, the fastener 522_{19} is pulled outward with fin-

gertips hooked on to the protrusions 13_{19} as shown in Fig. 51. Then, the fastener 522_{19}, while being elastically deformed, is removed from the outer wall surface of the manipulating part 1. Thus, the foul fluid absorbing member 21_{19} is removed to replace with a new one.

Returning to Fig. 47, the upper foul fluid absorbing member 21_{19}a is retained by the first fastener 522_{19} at a portion of manipulating part 1 immediately above the operative instrument insertion entrance 5 and is extended upwardly so that it can gripped by the inner side of the operator's hand that grips the manipulating part 1.

Foul fluids that escape from the operative instrument insertion entrance 5 are thus prevented from getting on the hand and the manipulating part 1 is made less slippery and thus more easy to hold. The upper foul fluid absorbing member 21_{19}a itself can also be held in a stable manner.

Meanwhile, the lower foul fluid absorbing member 21_{19}b is retained by the second fastener 522_{19} at a portion of the manipulating part 1 immediately below the operative instrument insertion entrance 5 and is extended downwardly therefrom. Further, the free end 21_{19}c, which is positioned above the second fastener 522_{19}, is placed on top of the operative instrument insertion entrance (5) portion so as to cover this portion.

Thus, even when foul body cavity fluids that have passed through the operative instrument insertion channel escape from the operative instrument insertion entrance 5, most of such fluids can be absorbed by foul fluid absorbing member 21_{19}b at the free end 21_{19}c and can be prevented from splashing externally or getting on the hands or face of the operator.

The foul fluids that splash or seep upwards from the operative instrument insertion entrance 5 will be absorbed by the upper foul fluid absorbing member 21_{19}a, thus preventing the hand of the operator that grips manipulating part 1 from getting dirty.

Furthermore, the foul fluids that tend to drip downward from the operative instrument insertion entrance 5 are absorbed by the lower half portion of the lower foul fluid absorbing member 21_{19}b and are thus prevented from dripping down further. The bed and the patient's skin will thus be prevented from getting dirty.

To insert an operative instrument via the operative instrument insertion entrance 5, the operative instrument is inserted into the operative instrument insertion entrance 5 as shown by arrow A (Fig. 47) upon withdrawing the free end 21_{19}c of the foul fluid absorbing member 21_{19} from the operative instrument insertion entrance (5) portion as indicated by two-dotted chain line of Fig. 47.

In addition, the free end 21_{19}c of the foul fluid absorbing member 21_{19} to cover the operative tool insertion entrance (5) portion may be provided on the upper side foul fluid absorbing member 21_{19}a. Furthermore, the finger hook protrusion of the fastener may be formed to have a large protruded amount as shown in Fig. 52 (a finger hook protrusion 13_{20}) or the finger hook protrusion may be formed at the opening edge portion of the fastener as shown in Fig. 53 (a finger hook protrusion 13_{21}).

Fig. 54 shows another embodiment of the present invention wherein the upper side foul fluid absorbing member 21_{22}a and the lower side foul fluid absorbing member 21_{22}b are retained on the manipulating part 1 with a single fastener 522_{22}.

With this fastener 522_{22}, as shown in Fig. 55, the upper side presser part 522_{22}a for pressing the upper side foul fluid absorbing member 21_{22}a and the lower side presser part 522_{22}b for pressing the lower side foul fluid absorbing member 21_{22}b are formed into a shape of a horseshoe-like cross section respectively, both being integrally connected by a pair of right and left slender connecting parts 522_{22}c.

Among these parts 522_{22}a, 522_{22}b and 522_{22}c, the opening part 522_{22}d through which the protruding part 3 can pass is formed so that the fastener 522_{22} may not interfere with the protruding part 3 formed at its end with the operative tool insertion entrance 5.

Thus, since the upper side foul fluid absorbing member 21a and the lower side foul fluid absorbing member 21_{22}b can be retained on the manipulating part 1 with the single fastener 522_{22}, only one operation enables the attachment and removal of the fastener 522_{22} and thus the handling is made simple.

While in this embodiment, the free end 21_{22}c of the foul fluid absorbing member 21_{22} to cover the operative tool insertion entrance (5) portion is provided on the upper side foul fluid absorbing member 21_{22}a, the free end of the lower side foul fluid absorbing member 21_{22}b may be used. Furthermore, only one connecting part 522_{23}c may be provided as in the embodiment shown in Fig. 56.

Fig. 57 is a perspective view of the fastener 522_{24} in another embodiment of the present invention and Fig. 58 is a front view thereof. Fig. 59 is a sectional view of the tube 522_{24}' to be used as a material for forming the fastener 522 of this embodiment. The fastener 522_{24} of this embodiment is formed by cutting the material tube 522_{24}'.

While the fastener 522_{24} of this embodiment is formed into a shape almost the same as that of the fastener 522_{24} shown in Fig. 55, the ear-shaped tab portions 522_{24}e to pinch with fingertips during attachment and detachment to and from the manipulating part 1 are formed protrudingly at the both edge portions.

Since both axial ends of the material tube 522_{24}' is funnel-like spreading cylindrical shape, the fastener 522_{24} obtained by machining the material tube 522_{24}' has also a shape of both ends spreading outward.

As a result, the ear-shaped portions 522_{24}e formed at the edges can be pinched easily with fingertips during the attachment and detachment of the fastener 522_{24}. Furthermore, since the fastener 522_{24} is formed symmetrical vertically and laterally (i.e., symmetrical about

the axial direction and a direction between which the axis is sandwiched), no restriction is made on the mounting direction with respect to the manipulating part 1.

Fig. 60 shows another embodiment of the present invention, which is the same with the embodiment shown in Fig. 55, in that the upper side foul fluid absorbing member and the lower side foul fluid absorbing member can be retained on the manipulating part 1 with the single fastener.

In this embodiment, as shown in Fig. 61, the opening portion 522_{25}d for passing the protruding portion 3 is bored in the central portion of the cylindrical fastener 522_{25} formed into a horseshoe shape in section. Numeral 13_{25} designates the finger hook protrusion.

Fig. 62 shows another embodiment of the present invention in which the fastener shown in Fig. 48 is used in combination with the foul fluid absorbing member shown in Fig. 28. A hole 222_{26} is opened in the central portion to permit the protrusion 3 of the manipulating part 1 to pass therethrough.

Although in Fig. 62, the upper free end is used as free end 21_{26}c of the foul fluid absorbing member 21_{26} for covering the operative instrument insertion entrance 5, the lower free end may be used instead. Also, although just one retaining member 522_{26} is attached at the upper side with respect to the operative instrument insertion entrance 5, a plurality of retaining members (fasteners) may be attached thereto.

Pressure-sensitive adhesive agent may also be used as a means for retaining a foul fluid absorbing member 21_{26} in the embodiment shown in Fig. 62, onto manipulating part 1.

The foul fluid splashing preventive device according to the present invention can be applied to an endoscope insertion guiding device such as a sliding tube.

Fig. 65 shows a sliding tube 50 used as an endoscope insertion guiding device. The sliding tube 50 is made up of a pipe-like member having a relatively simple construction with some flexibility and a length of about 40cm. A proximal mouthpiece 53 is mounted to the proximal end portion of the sliding tube 50.

The flexible pipe-like portion is formed such that a flexible sheath or coat 52 closely contacts both the inner and outer surfaces of a spiral tube 51 formed for example by winding a stainless steel web into a spiral manner at intervals with a fixed diameter.

Flexible sheath 52 is formed from a flexible tube such as a polyurethane resin tube, and as illustrated in enlarged manner in Fig. 66, a single tube is folded at a front end portion 50a.

The proximal mouthpiece 53 is made of metal or hard plastic, and a hole that is in alignment with and in communication with the inner diameter part of flexible sheath 52 is bored through the proximal mouth piece 53 in the axial direction.

In order to prevent the entire sliding pipe from entering into the anus during use, the diameter of proximal mouthpiece 53 is made somewhat larger than the outer diameter of the flexible pipe-like portion fitted with flexible sheath 52.

Fig. 63 shows the manner in which a foul fluid absorbing member 21_{27}, formed from water-absorbing material to absorb the foul fluids that escape from the anus, is detachably attached to the outer peripheral portion of the proximal mouthpiece 53.

The foul fluid absorbing member 21_{27}, made for example by overlapping flexible, gauze-like material shaped to have a rectangular form, is attached to the proximal mouthpiece 53 by means of a fastener (retaining member) 522_{27} which is attached to the outer surface of flexible sheath 52 adjacent the proximal mouthpiece 53. The foul fluid absorbing member 21_{27} thus retained by the fastener 522_{27} covers and surrounds the periphery of proximal mouthpiece 53 and the adjacent flexible sheath 52 as well as extends beyond the proximal end.

A pair of finger hook protrusions 13_{27} are protruded in the diametrical opposite direction from the outer surface of the fastener 522_{27}.

Fig. 64 is a sectional front view of the part at which foul fluid absorbing member 21_{27} is retained on the sliding tube 50. The fastener 522_{27} is fixed by its own resilience in such a manner as to clamp the outer wall face of flexible sheath 52 radially inwardly while sandwiching the foul fluid absorbing member 21_{27} between itself and the outer wall face of the flexible sheath 52 of the sliding tube 50.

Fig. 67 shows the usage condition of the sliding tube 50. As shown therein, after bringing sliding tube 50 to the condition where it straightens the colon (102) portion while leaving just the proximal mouthpiece (53) portion outside the anus 101, the inserted endoscope part 2 that has been inserted through the sliding tube 50 is gradually pushed in deeper while being pushed and pulled.

A sponge member is not disposed inside the proximal mouthpiece 53 of sliding tube 50 as in the previously explained case (Fig. 87). Thus, when air is to be blown out from the inside of the large intestine, it is blown out from the gap between the sliding tube 50 and the inserted part 2 that has been inserted through the sliding tube 50.

In that case, since the opened mouth of the proximal mouthpiece 53 and the periphery of the inserted part 2 adjacent the opened mouth are surrounded by the foul fluid absorbing member 21_{27}, the liquified feces, that are mixed with the air blowing out from the opened mouth of the proximal mouthpiece 53, are thus absorbed by the foul fluid absorbing member 21_{27} and can not splash therefrom.

Further, since the outer peripheral surface of inserted part 2 can be wiped with the foul fluid absorbing member 21_{27} when the inserted part 2 is pushed and pulled during the insertion of the inserted part 2, the operator's hands can be prevented from staying dirty

with feces.

Furthermore, since the outer peripheral surface of the inserted part 2 can also be wiped with the foul fluid absorbing member 21_{27} when the inserted part 2 is pulled out from the inside of the sliding tube 50 after completion of endoscopy, the operator's hands can be prevented from staying dirty with feces.

Fig. 68 shows another embodiment of the present invention in which a fastener 522_{28} is fixed and retained onto the proximal mouthpiece 53 of the sliding tube 50 to retain the foul fluid absorbing member 21_{28} in place.

The fastener 522_{28} is formed from metal or hard plastic having spring-like property into a horseshoe-like (or C-like) shape with an opening width d that is smaller than a diameter D (d < D) as shown in Fig. 69. The fastener 522_{28} is fixed and retained in such a manner as to clamp the outer wall face of the proximal mouthpiece 53 radially inwardly by its own resilience while sandwiching the foul fluid absorbing member 21_{28} between itself and the outer wall face of the proximal mouthpiece 53.

Collar-like stopper protrusions 42_{28}, which come in contact with the end faces of the proximal mouthpiece 53 in the condition where the foul fluid absorbing member 21_{28} is sandwiched therebetween, are protruded inwards at the front and rear axial ends of the fastener 522_{28}. The movement of the fastener 522_{28} in the axial direction is restricted by these stopper protrusions 42_{28}.

Fig. 70 is a front view of the fastener 225_{28}, and the portion that protrudes inwards from the broken line is the stopper protrusion 42_{28}. The finger hook protrusions 13_{28} protrude from the outer faces of the ends of the horseshoe-shaped cross section.

Fig. 71 shows another embodiment of the present invention in which, as in the embodiment shown in Fig. 68, a fastener 522_{29} is fixed to the proximal mouthpiece 53 of the sliding tube 50 to retain the foul fluid absorbing member 21_{29} in place.

As shown by the cross sectional view (Fig. 72) and by the front view (Fig. 73), the fastener 522_{29} is formed to have a horseshoe-like cross-sectional shape and is fixed and retained in such a manner as to clamp the outer wall face of the proximal mouthpiece 53 radially inwardly while sandwiching the foul fluid absorbing member 21_{29} between itself and the outer wall face of proximal mouthpiece 53.

However, the length of the fastener 522_{29} in the axial direction is made shorter than the proximal mouthpiece 53. The stopper protrusions 42_{29}, with a hook-like form, are extended from the front and rear sides of the fastener 522_{29}. The end portions of the stopper protrusions 42_{29} are protruded inwards and these portions contact the front and rear ends of the proximal mouthpiece 53 to restrict the movement of fastener 225_{29} in the axial direction.

Fig. 74 shows another embodiment of the present invention. As shown by the cross sectional view (Fig. 75), flat parts 53b are formed at both side faces of the middle portion of the proximal mouthpiece 53 of the sliding tube 50, and the fastener 522_{30} is formed to have a horseshoe-like shape having linear parts at the left and right sides in correspondence with the flat parts 53b. The fastener 522_{30} is formed from material having a spring-like property.

The movement of the fastener 225_{30} in the axial direction is restricted since the flat parts 53b are formed only on the middle portion of the outer face of the proximal mouthpiece 53 and the fastener 522_{30} comes in contact with step parts 53c on the proximal mouthpiece 13 when it is moved in the axial direction.

As shown in Fig. 75, the end portions 44_{30} of the fastener 522_{30} are bent slightly inwards to enable secure engagement with the proximal mouthpiece 53. Reference numeral 13_{30} designates a finger hook protrusion. The finger hook protrusion can be dispensed with.

Fig. 76 shows another embodiment of the present invention in which a pair of flanges 53a, which are spaced in the axial direction, are protruded from the proximal mouthpiece 53' of the sliding tube 50 and the fastener 522_{31} is attached between these flanges 53a. The movement of the fastener 522_{31} in the axial direction is thus restricted by flanges 13a. Fig. 77 shows the cross section along line 77-77 of Fig. 76. In this embodiment, the foul fluid absorbing member 21_{31} is wound around the proximal mouthpiece 53' one or more turns, and is retained onto the proximal mouthpiece 53' by the fastener 522_{31} under that condition.

Fig. 78 shows another embodiment of the present invention in which a rubber-like string member is used as the retaining member 22_{32} for retaining the foul fluid absorbing member 21_{32} onto the outer peripheral surface of the proximal mouthpiece 53'. As best shown in Fig. 79, this retaining member 22_{32} is formed to have a ring-like form for example by tying both ends of a single rubber string.

Fig. 80 shows another embodiment of the present invention in which a pressure-sensitive adhesive agent 122_{33} is applied to the portion of the foul fluid absorbing member 21_{33} that is to be attached to the proximal mouthpiece 53. Fig. 81 shows the condition in which this foul fluid absorbing member 21_{33} has been attached to the proximal mouthpiece 53. The foul fluid absorbing member 21_{33} is fixed and retained by adhesion to the proximal mouthpiece 53 by the pressing of the pressure-sensitive adhesive (122_{33}) portion of the foul fluid absorbing member 21_{33} from the outer side against the outer peripheral surface of the proximal mouthpiece 53. After use, the foul fluid absorbing member 21_{33} can be subjected to disposal upon peeling the pressure-sensitive adhesive 122_{33} from the proximal mouthpiece 53.

Figs. 82 to 84 shows another embodiment of the present invention in which a foul fluid splashing preventive device 20_{34} including a foul fluid absorbing member and a retaining member is attached to the forceps plug 11.

Fig. 82 shows the operative instrument insertion entrance (5) portion in an enlarged manner. The forceps plug 11 is formed from a resilient rubber material. The central portion of the forceps plug 11 fits smoothly into the inside of the operative instrument insertion entrance 5 and a slit 11a is formed in this central portion.

A flange with which the forceps plug 11 engages is formed on the tip portion of a mouthpiece 10 protruded from the manipulating part 1. The forceps plug 11 is formed to have a shape that covers mouthpiece 10 in a closely contacting manner. Since forceps plug 11 has resilience, it can be attached and detached freely to and from the mouthpiece 10 while being deformed.

A foul fluid splashing prevention device 20_{34}, for preventing the outward splashing of the foul fluids that leak out from slit 11a of the forceps plug 11, is detachably disposed on forceps plug 11.

The foul fluid splashing prevention device 20_{34} includes a foul fluid absorbing member 121_{34}, formed from a resilient, water-absorbing, open-cell, foamed material, such as a sponge, which is fitted inside a plastic case (retaining member) 621_{34} having a cap-like shape with a hole 622_{34}a in the center.

As shown in Fig. 83, the foul fluid absorbing member 121_{34} is formed by dividing, for example, a short cylindrical member into two in the vertical direction along plane 121_{34}a that passes through the axis. And as shown in Fig. 82, the foul fluid absorbing member 121_{34} is positioned to face the entrance of the forceps plug 11 with the position of the central axis being matched with that of the forceps plug 11. The halves of the foul fluid absorbing member 121_{34} are in a closely contacting condition that prevents the forming of a gap in between. The foul fluid absorbing member 121_{34} can also be divided into three or more parts.

A flange 11b, with which the case or retaining member 622_{34} of the foul fluid splashing prevention device 20_{34} engages, is protruded from the outer peripheral surface of the forceps plug 11, and the case 622_{34} of the foul fluid splashing prevention device 20_{34} is formed to have a shape that covers the flange 11b in a closely contacting manner. And since the forceps plug 11b has resilience, it can be freely attached and detached while being deformed with respect to the case 622_{34}.

With the embodiment formed in the above manner, even when the foul fluids from the inside of the body cavity leak out to the exterior from the forceps channel 4 via slit 11a of the forceps plug 11 due to the increased internal pressure of the body cavity, the foul fluid that has leaked out can be absorbed by the foul fluid absorbing member 121_{34} disposed immediately outside the slit 11a and can be collected inside the case 622_{34}.

When an operative instrument is to be used, the operative instrument is passed through the hole 622_{34}a of the case 622_{34} and between division faces 121_{34}a of the foul fluid absorbing member 121_{34} while spreading the foul fluid absorbing member 121_{34} and being in close contact with division faces 121_{34}a, and then the operative instrument is inserted into the forceps channel 4 from the operative instrument insertion entrance 5 while spreading slit 11a of forceps plug 11.

Although the amount of leakage of foul fluids from the slit 11a increases when the operative instrument is inserted into the forceps plug 11 in the above manner, the foul fluids that have leaked will be absorbed by foul fluid absorbing member 121_{34} and collected in the case 121_{34} even in this case.

When the operative instrument has been drawn back out, the slit 11a of the forceps plug 11 and the division faces 121_{34}a of the foul fluid absorbing member 121_{34} are both closed by the resilience of the respective parts of themselves and return to the condition prior to the insertion of the operative instrument.

Fig. 85 shows another embodiment of the present invention in which the foul fluid absorbing member 121_{35} is formed as a single block from a weak water-absorbing material (for example, a sponge of high expansion or foam ratio and coarse foam density).

In this case, the foul fluid absorbing member 121_{35} is pierced by the operative instrument that is inserted. The embodiment shown in Fig. 86 can be used in the same manner as the embodiment shown in Fig. 82, and the fluid that leaks out from slit 11a of forceps plug 11 can be absorbed by the foul fluid absorbing member 121_{35} and collected in the case 622_{35}.

Fig. 86 shows another embodiment of the present invention in which the case 622_{36} of the foul fluid splashing prevention device 20_{36} and the forceps plug 11 are formed integrally from rubber material and the foul fluid absorbing member 121_{36} is fitted into this integral part, so that a single unit of the forceps plug 11 and the foul fluid splashing prevention device 20_{36} can be attached to and detached from the mouthpiece 10 of the operative instrument insertion entrance 5. Although the foul fluid absorbing member 121_{36} is divided into two pieces, it can also be formed as an integral piece.

With the above arrangement, not only the leakage of the foul fluids to the exterior is reduced further but the number of parts is also reduced. Therefore, the manufacturing cost becomes lower, and it is possible to achieve the economical purpose even if the device is used as a disposal device.

Claims

1. A fluid splashing preventive device adapted for use with an endoscope, said endoscope defining an external opening which is in communication with a body cavity and through which fluids within said body cavity can escape, said fluid splashing preventive device comprising:

   a retaining member provided to said endoscope; and

   a flexible, fluid absorbing member mountable onto said endoscope by said retaining member,

said flexible, fluid absorbing member covering said external opening and absorbing said escaping fluids.

2. A fluid splashing preventive device according to claim 1, wherein said retaining member includes an elastically contractible band member attached to said fluid absorbing member.

3. A fluid splashing preventive device according to claim 1, wherein said retaining member includes a pressure-sensitive adhesive material provided on said fluid absorbing member.

4. A fluid splashing preventive device according to claim 1, wherein said retaining member includes a hole formed through said fluid absorbing member.

5. A fluid splashing preventive device according to claim 1, wherein said retaining member includes a flanged member attached to said endoscope.

6. A fluid splashing preventive device according to claim 1, wherein said retaining member includes a plug member generally closing said external opening.

7. A fluid splashing preventive device according to claim 1, wherein said retaining member includes an elastically deformable fastener C-shaped in section.

8. A fluid splashing preventive device according to claim 1, wherein said retaining member includes a case attached to said endoscope with said fluid absorbing member accommodated therein.

9. A fluid splashing preventive device according to claim 1, further comprising:

a sliding tube into which a portion of said endoscope is inserted, wherein said endoscope defines said external opening in relation to said sliding tube, and wherein said fluid absorbing member is mountable to said sliding tube by said retaining member.

10. A fluid splasing preventive device accoding to claim 1, wherein said retaining member is detachably provided to said endoscope.

11. A fluid splashing preventive device for an endoscope having an insertion part and a manipulation part, said manipulation part having an external opening which is in communication with a body cavity through said insertion part, said fluid splashing preventive device comprising:

a retaining member provided to said endoscope; and

a first flexible, fluid absorbing member mountable onto said manipulation part in the vicinity of said external opening by said retaining member.

12. A fluid splashing preventive device accoriding to claim 11, wherein said retaining member is detachably provided to said endoscope.

13. A fluid splashing preventive device according to claim 11, wherein said retaining member includes a band member adapted to circumscribe said manipulation part with said fluid absorbing member retained therebetween.

14. A fluid splashing preventive device according to claim 13, wherein said flexible, fluid absorbing member is foled to form an opening, and said band member extending through said opening.

15. A fluid splashing preventive device according to claim 14, wherein said band member includes a retaining ring at each end thereof.

16. A fluid splashing preventive device according to claim 15, wherein said manipulation part includes a protruded portion, said retaining being retained on said protruded portion.

17. A fluid splashing preventive device according to claim 11, wherein said retaining member includes a pressure-sensitive adhesive member adapted to be detachably connected to said manipulation part to retain said fluid absorbing member on said manipulation part upon receiving pressure.

18. A fluid splashing preventive device according to claim 11, wherein said external opening is provided on a protruded portion of a forceps channel on said manipulation part, and wherein said retaining member includes a hole portion formed through said absorbing member and adapted to be fitted to said protruded portion.

19. A fluid splashing preventive device according to claim 18, wherein said retaining member further includes a flange formed on a forceps plug, said forceps plug substantially closing said external opening.

20. A fluid splashing preventive device according to claim 11, wherein said retaining member further includes a flange formed on a forceps plug, said forceps plug substantially closing said external opening.

21. A fluid splashing preventive device according to claim 11, wherein said retaining member includes a portion of a forceps plug, said portion being adapted to clamp said absorbing member between said portion and an external surface of said manipulation part.

22. A fluid splashing preventive device according to claim 18, wherein said retaining member further includes a pressure member adapted to engage said protruded portion with said hole portion located between said pressure member and an external surface of said manipulation part.

23. A fluid splashing preventive device according to claim 22, further comprising a forceps plug substantially closing said external opening, wherein said pressure member is separated from said forceps plug.

24. A fluid splashing preventive device according to claim 11, wherein said retaining member includes a C-shaped elastically deformable fastener adapted to clamp said absorbing member between said C-shaped portion and an external surface of said manipulation part.

25. A fluid splashing preventive device according to claim 24, wherein said manipulation part includes a protruded portion of a forceps channel, said C-shaped fastener includes an opening, said prorud-ing portion extending through said opening.

26. A fluid splashing preventive device according to claim 11, further comprising a second absorbing member mountable onto said manipulation part and located adjacent said first fluid absorbing member.

27. A fluid splashing preventive device according to claim 26, wherein at least a portion of said first and second absorbing members overlap each other.

28. A fluid splashing preventive device according to claim 26, wherein said retaining member includes a C-shaped elastically deformable fasterner adapted to clamp both of said first and second absorbing members.

29. A fluid splashing preventive device according to claim 11, wherein said endoscope includes a forceps plug substantially closing said external opening, and said retaining member includes a case adapted to be mounted on said forceps plug with said absorbing member accommodated between said case and said forceps plug.

30. A fluid splashing preventive device for a flexible, tubular endoscope insertion guiding device inserted into an opening in a body to guide an inserted part of an endoscope toward a body cavity, said guiding device having a proximal end through which said inserted part of said endoscope is inserted into an inside of said guiding device, said fluid splashing preventive device comprising:

a retaining member provided to said proximal end; and

a flexible, fluid absorbing member mountable onto said guiding device in the vicinity of said proximal end by said retaining member.

31. A fluid splashing preventive device according to claim 30, wherein said retaining member includes a C-shaped elastically deformable fastener adapted to elastically clamp said absorbing member between said C-shaped fastener and an external surface of said guiding device.

32. A fluid splashing preventive device according to claim 31, wherein said C-shaped fastener includes stopper protrusions engaging a portion of said proximal end to restrict axial movement of said C-shaped fastener.

33. A fluid splashing preventive device according to claim 31, wherein said proximal end includes spaced flanges, said C-shaped fastener being positioned between said spaced flanges to restrict axial movement of said C-shaped fastener.

34. A fluid splashing preventive device according to claim 31, wherein said proximal end includes flat parts on side faces thereof, said C-shaped fastener being positioned at said flat parts to restrict axial movement of said C-shaped fastener.

35. A fluid splashing preventive device according to claim 30, wherein said retaining member includes a band member adapted to circumscribe an external surface of said guiding device, said fluid absorbing member being retained therebetween.

36. A fluid splashing preventive device according to claim 30, wherein said retaining member includes a pressure-sensitive adhesive member detachably retaining said fluid absorbing member on an external surface of said guiding device.

37. A fluid splashing preventive device according to claim 1, wherein said absorbing member includes a gauze.

38. A fluid splashing preventive device according to claim 1, wherein said absorbing member includes a sponge.

39. A fluid splashing preventive device accoridng to claim 1, wherein said absorbing member includes an open-cell material.

40. A fluid splashing preventive device according to claim 1, wherein said absorbing member includes a water-impregnatable non-woven fabric.

41. A fluid splashing preventive device accoding to claim 1, wherein said absorbing memeber includes a high molecular weight water-impregnatable polymer.

FIG.1

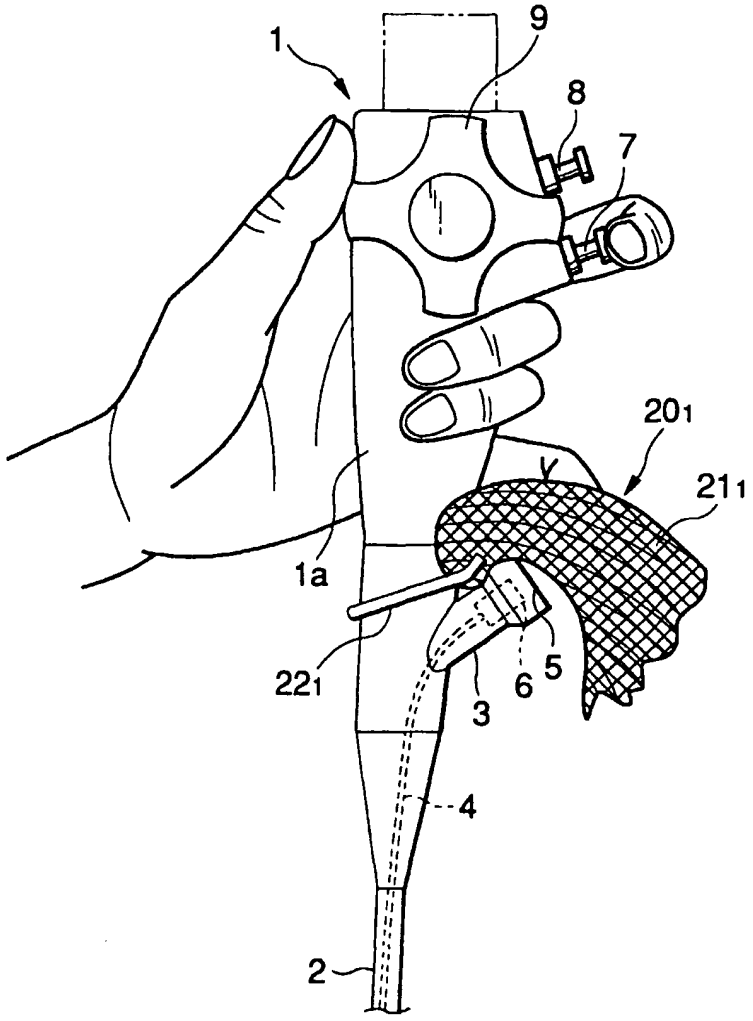


FIG.2

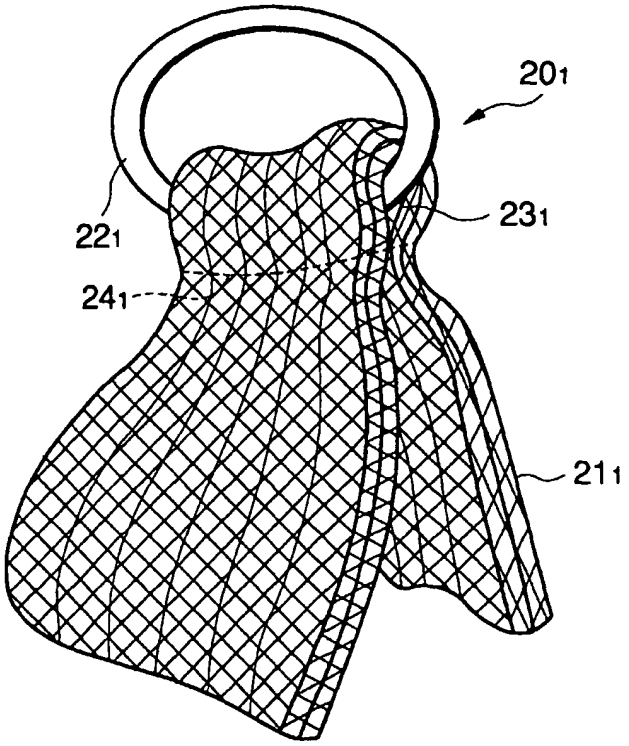


FIG.3

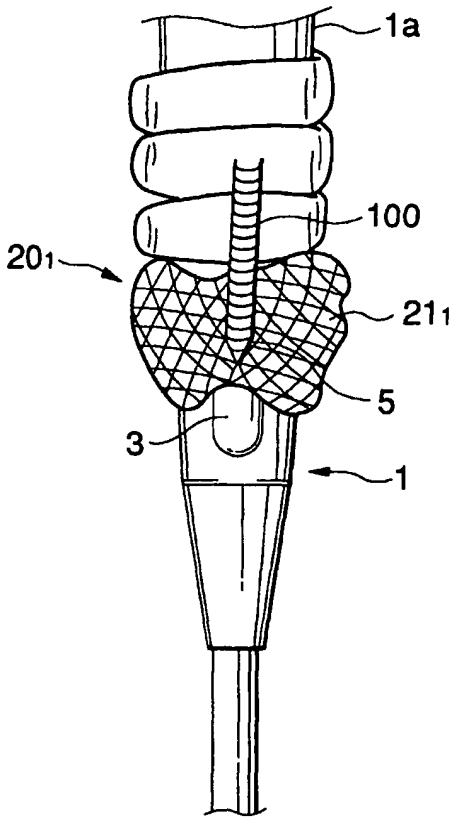


FIG.4

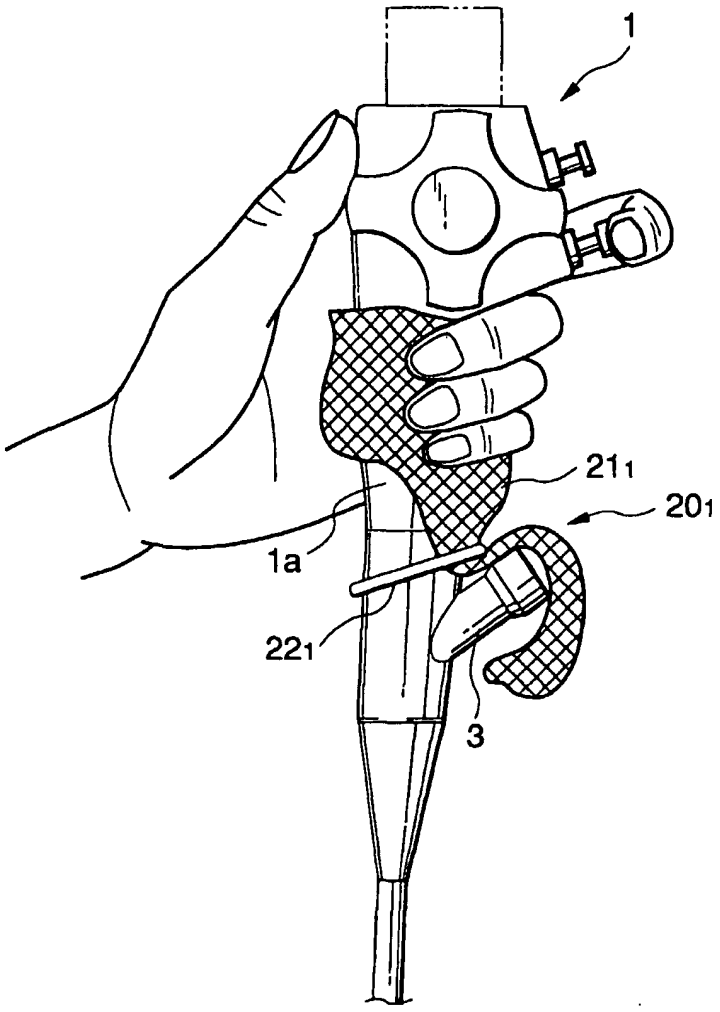


FIG.5

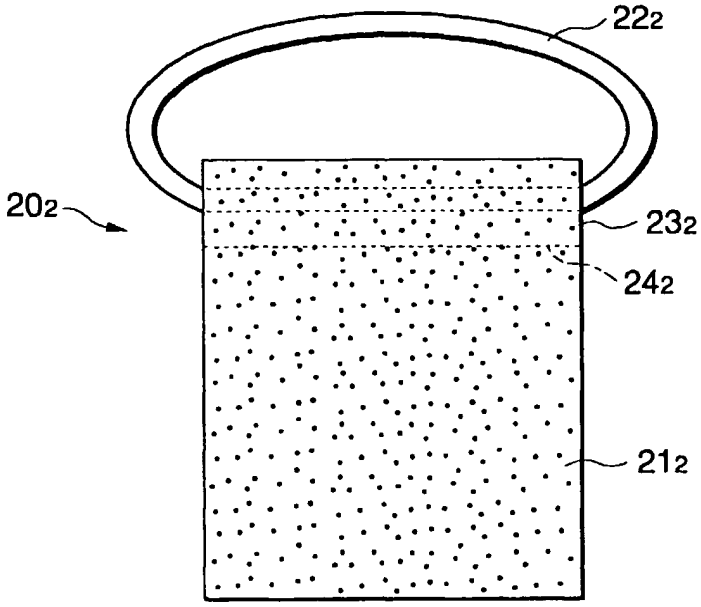


FIG.6

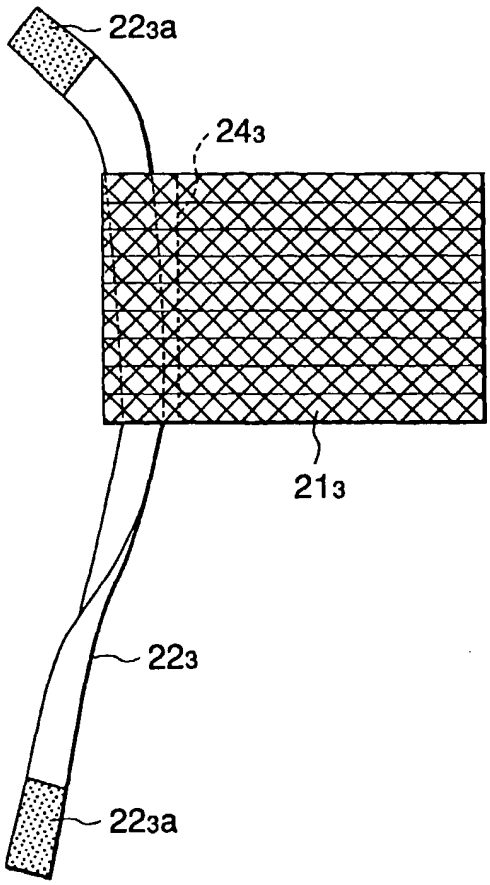


FIG.7

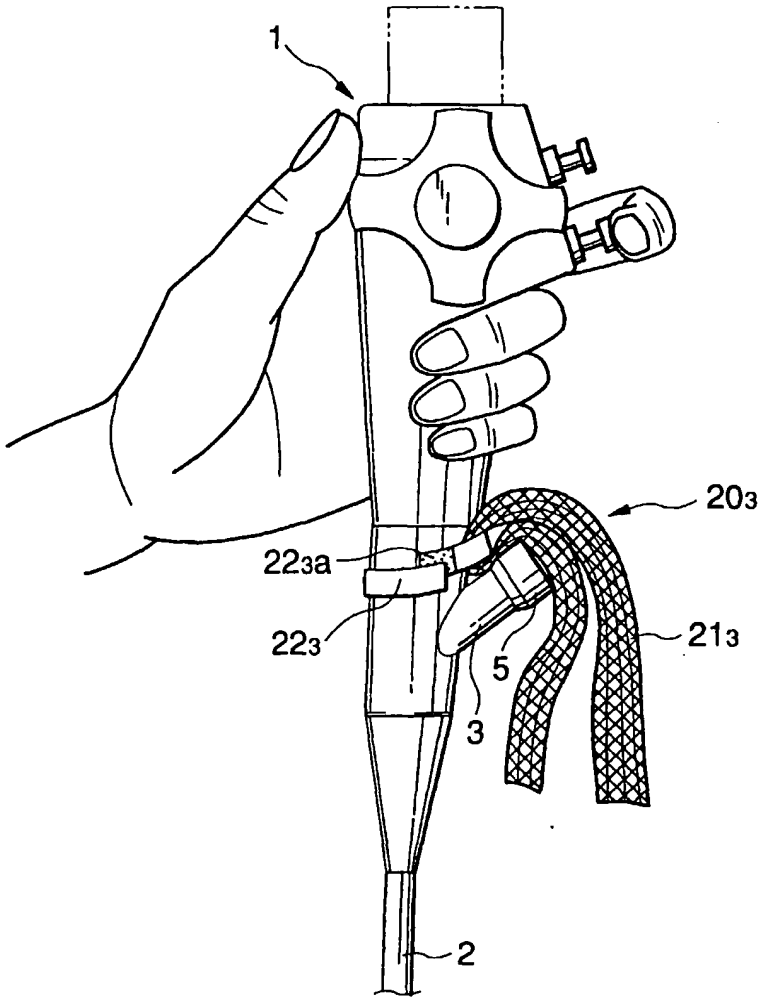


FIG.8

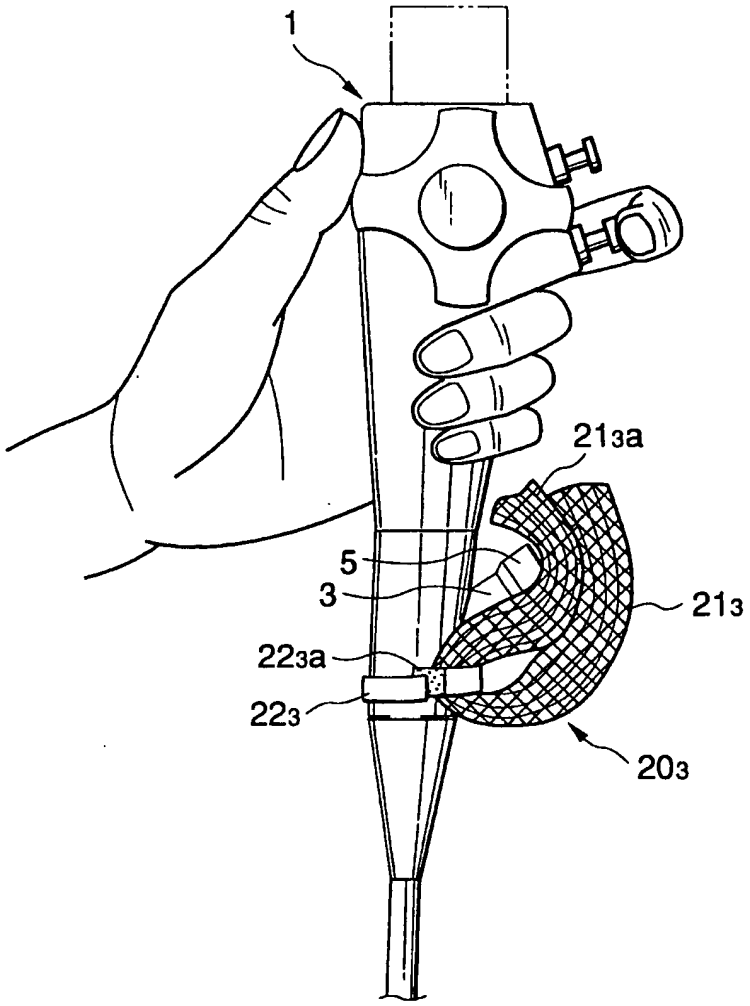


FIG.9

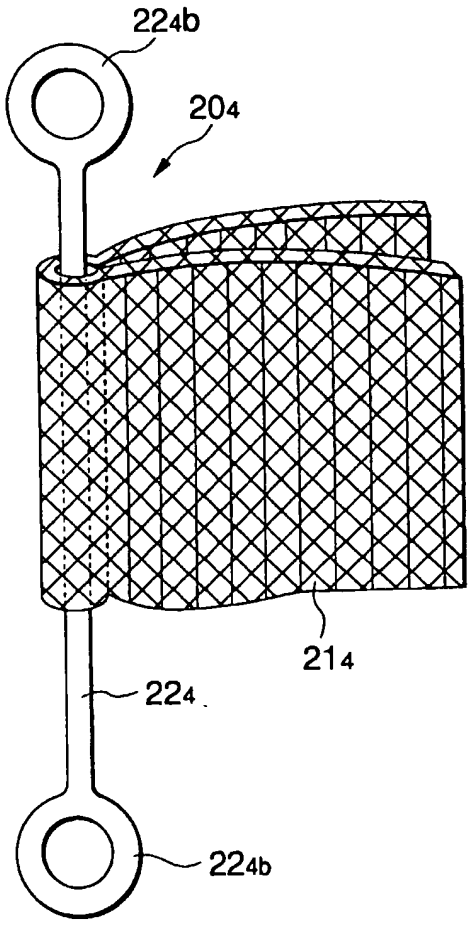


FIG.10

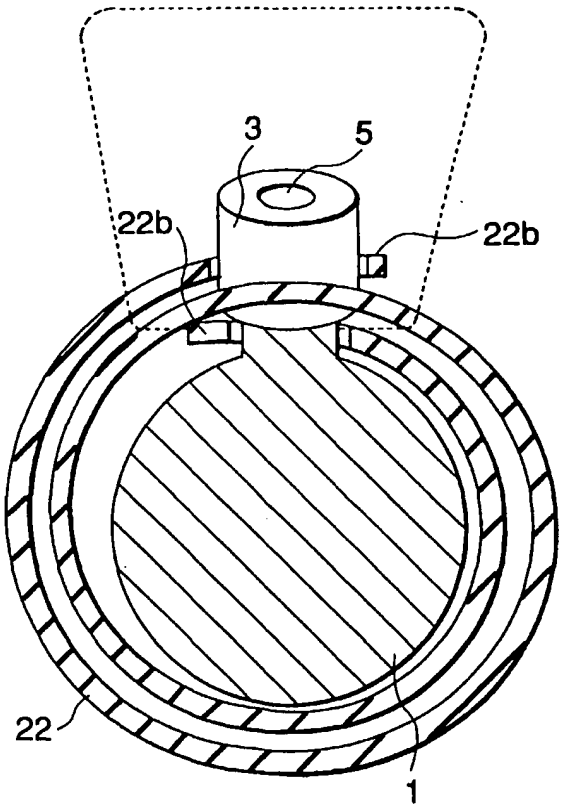


FIG.11

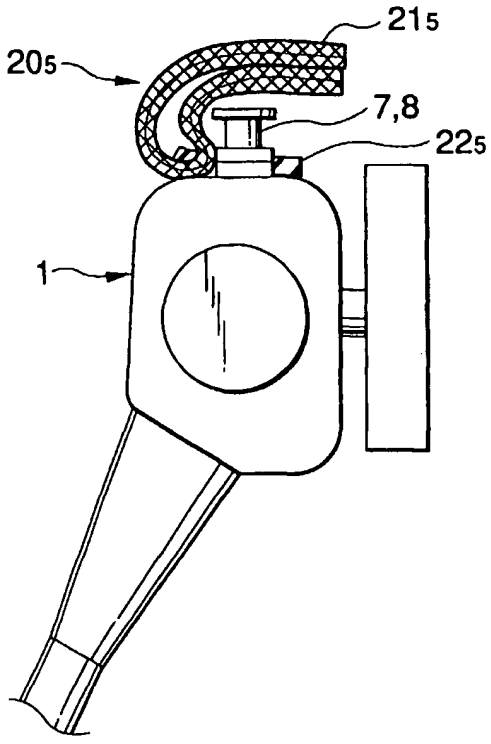


FIG.12

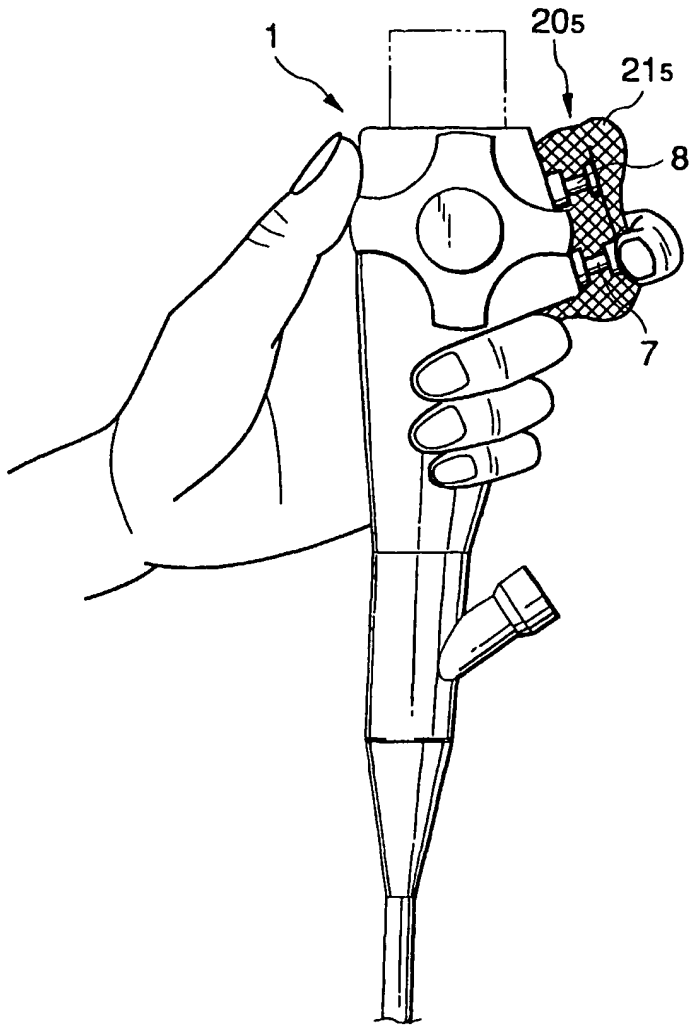


FIG.13

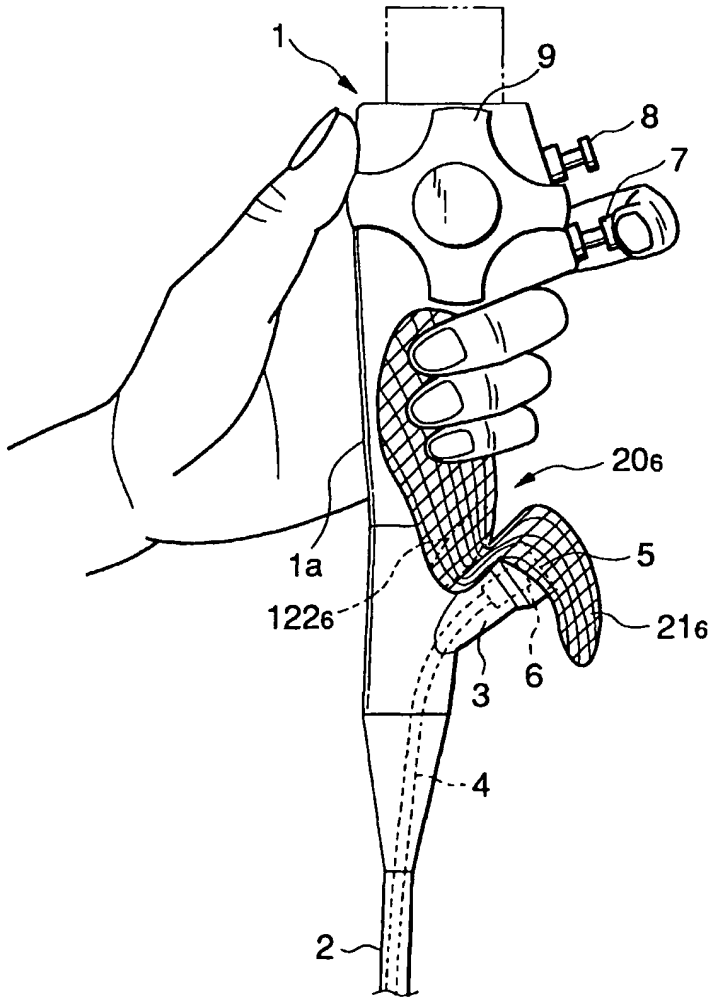


FIG.14

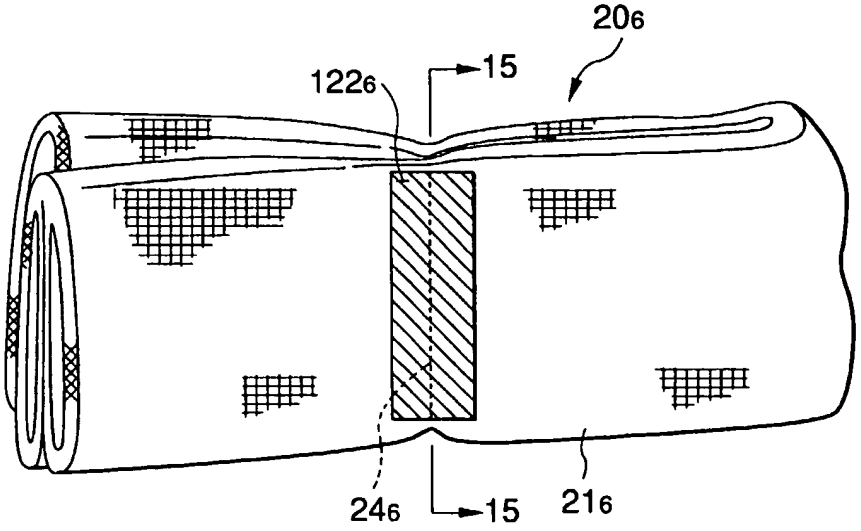


FIG.15

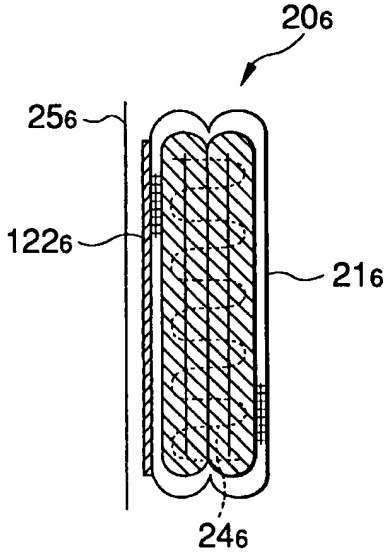


FIG.16

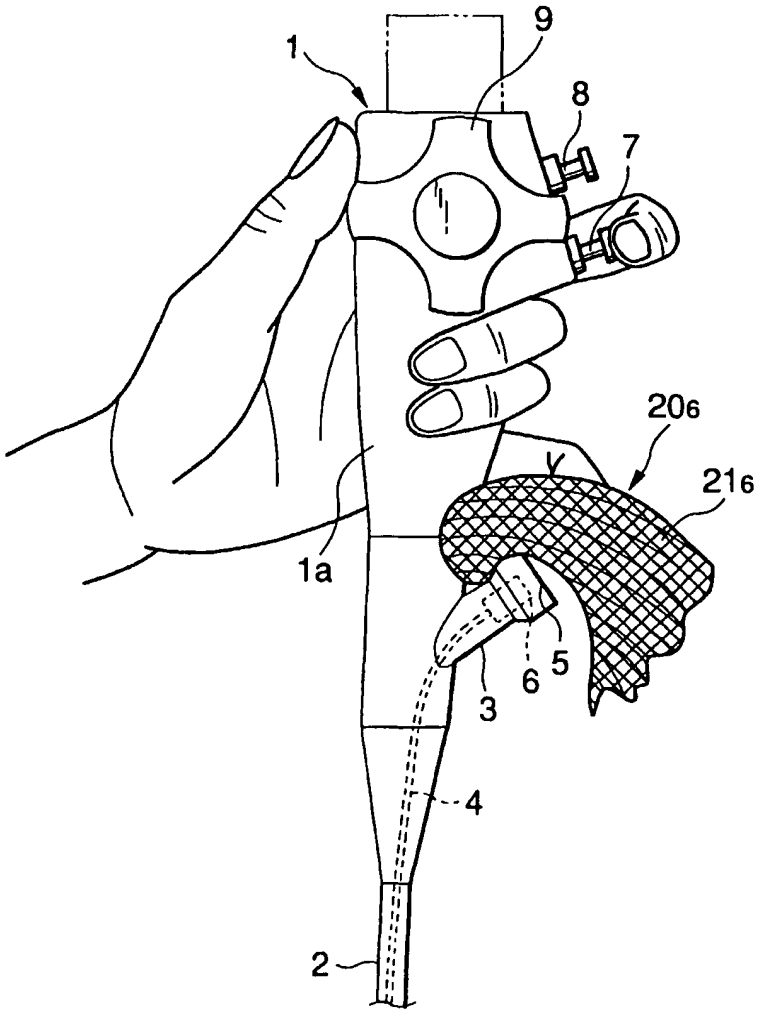


FIG.17

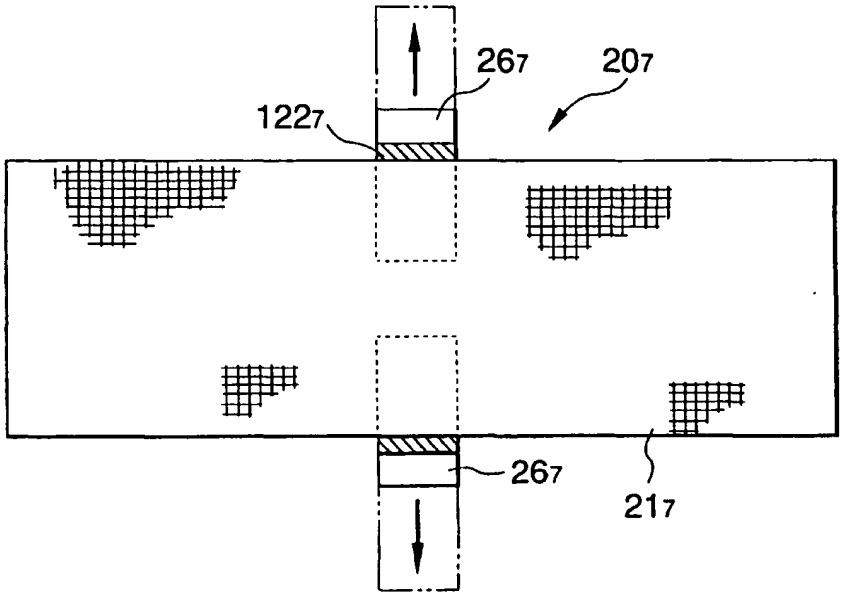


FIG.18

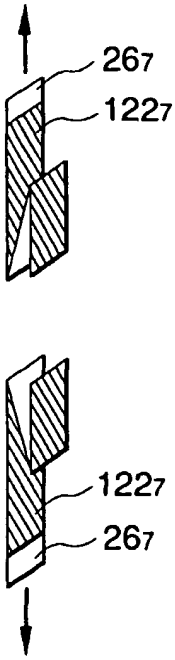


FIG.19

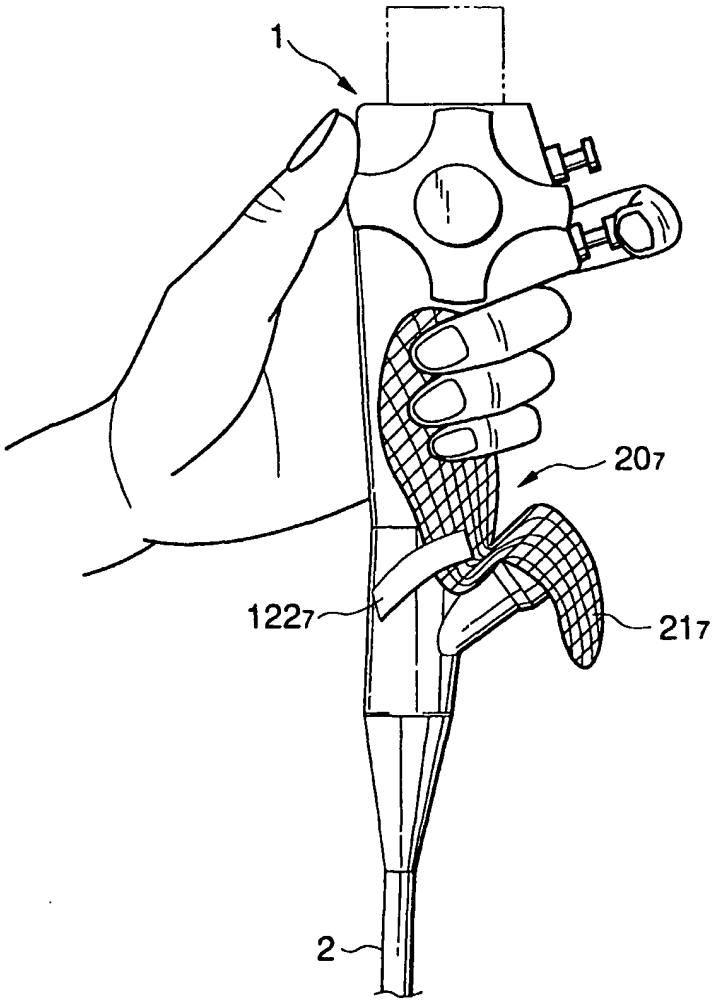


FIG.20

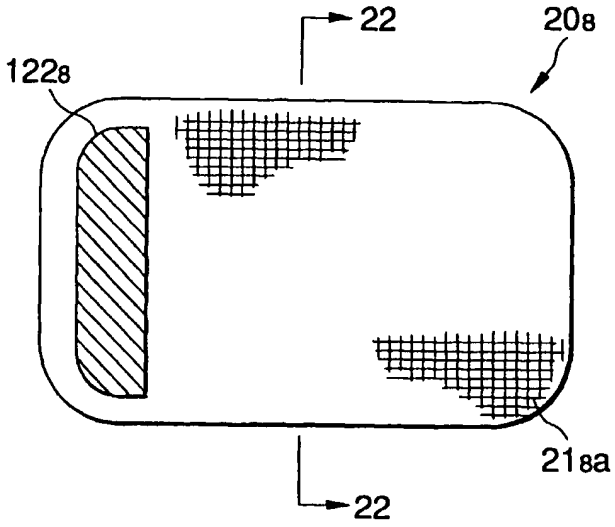


FIG.21

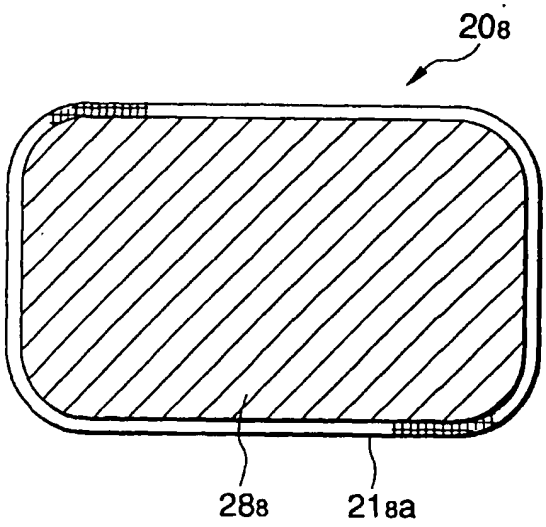


FIG.22

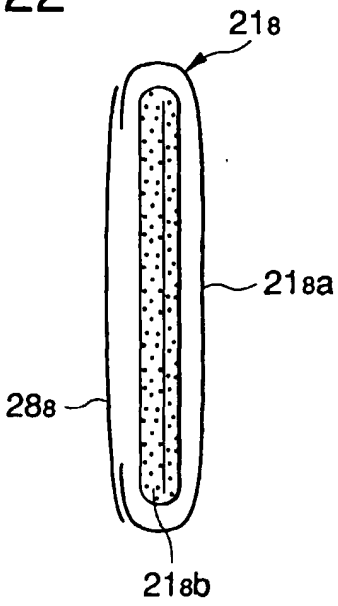


FIG.23

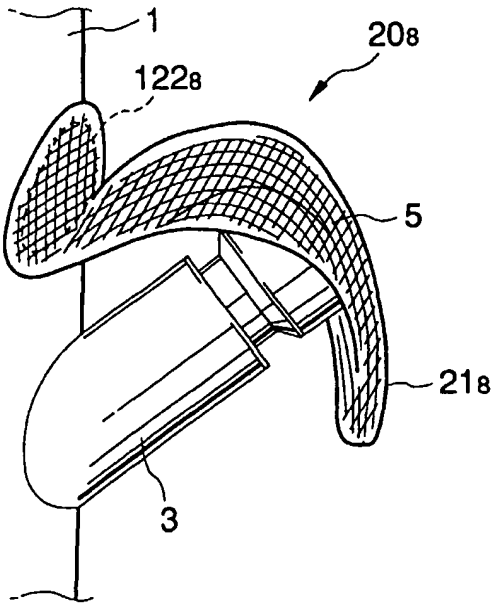


FIG.24

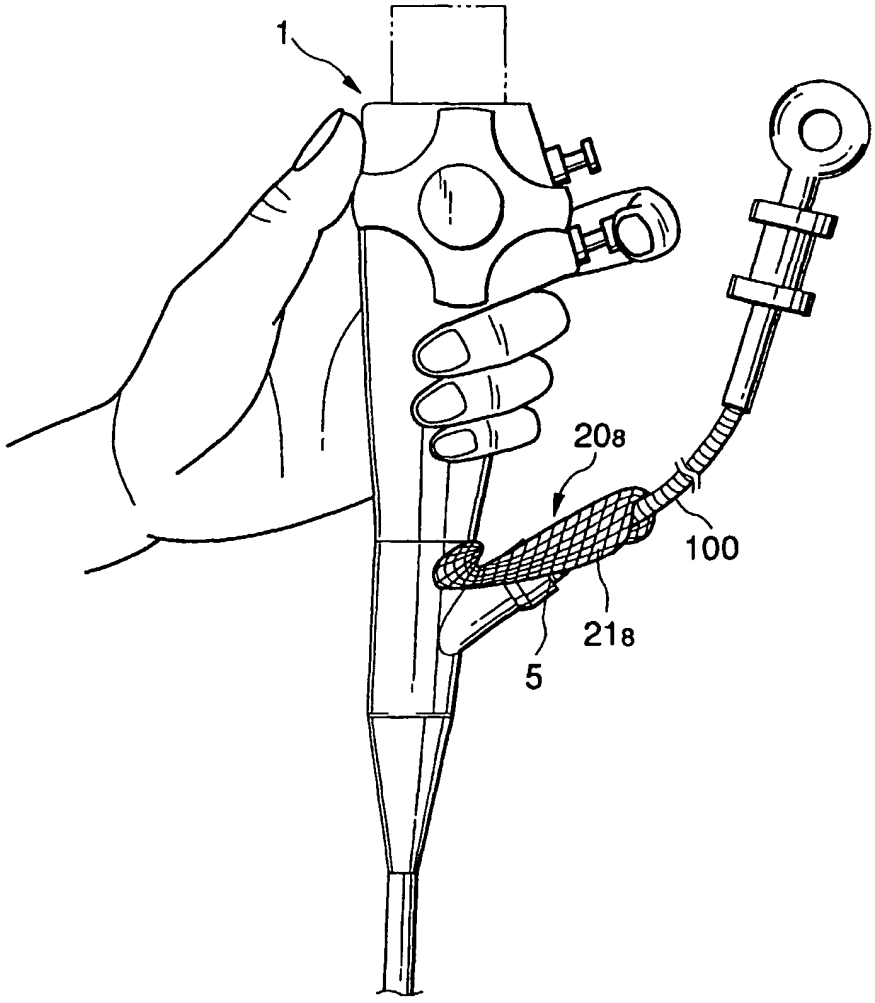


FIG.25

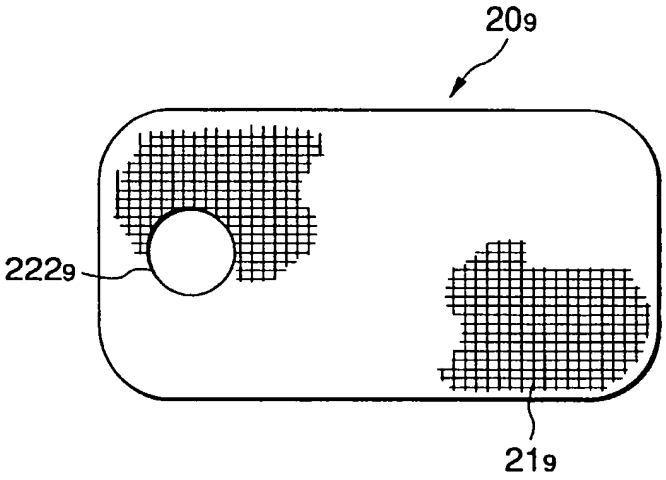


FIG.26

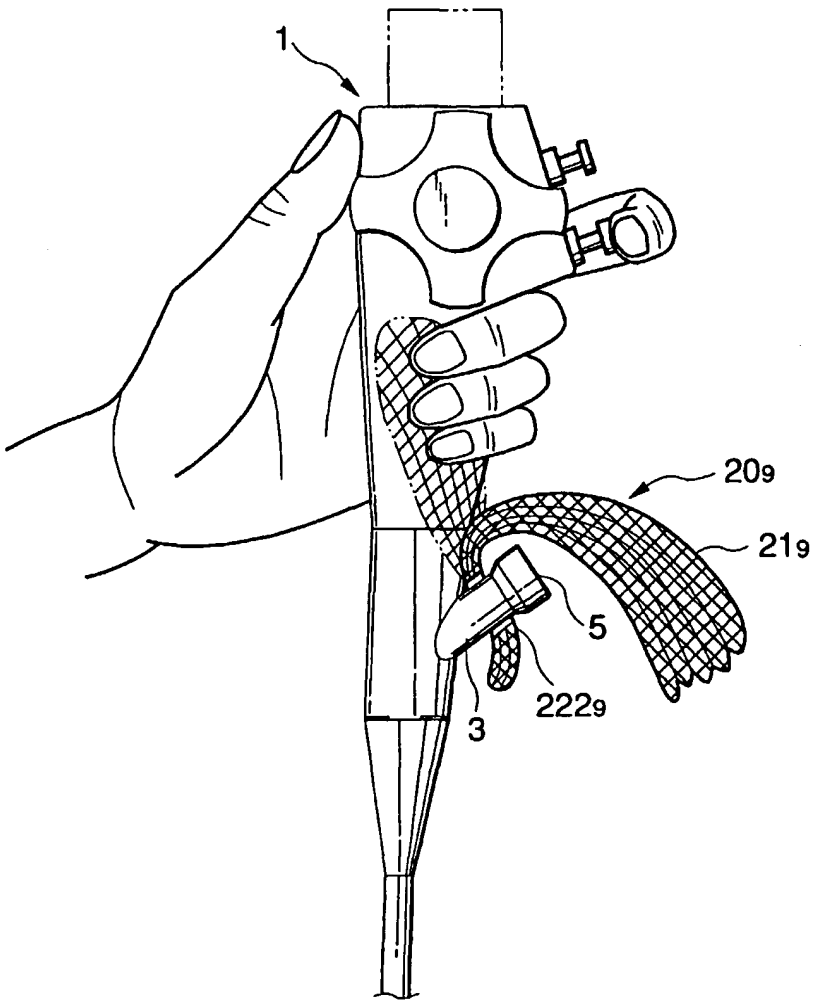


FIG.27

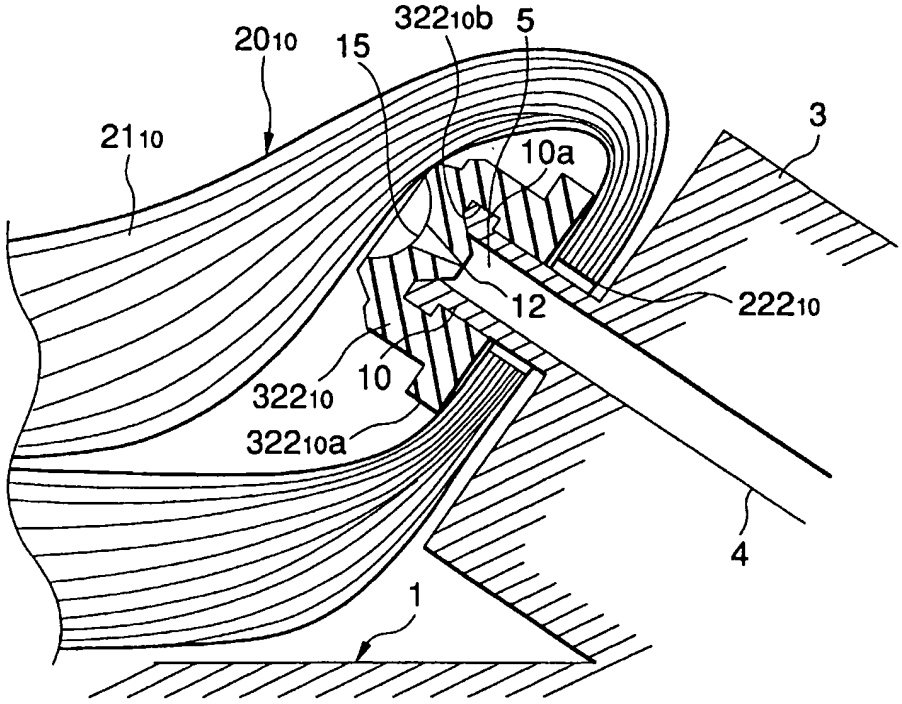

20_{10}
15
$322_{10}b$
5
21_{10}
10a
3
12
222_{10}
322_{10}
10
$322_{10}a$
4
1

FIG.28

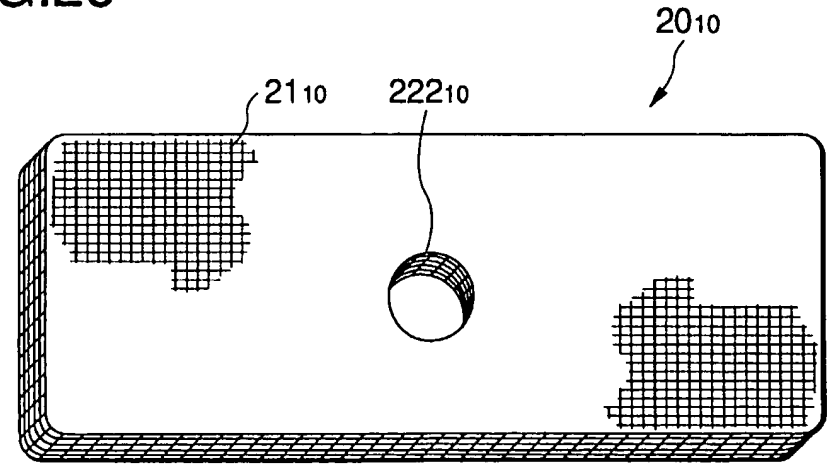

20_{10}
21_{10}
222_{10}

FIG.29

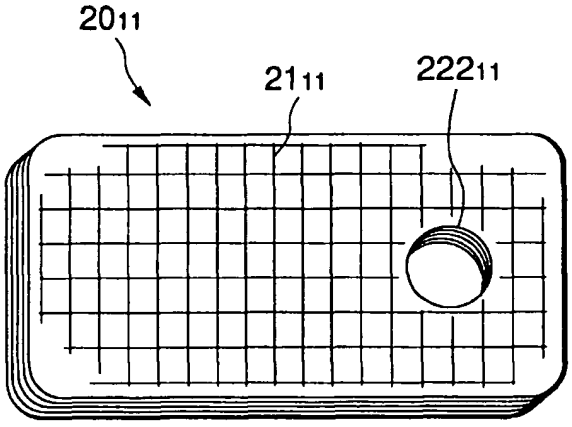


FIG.30

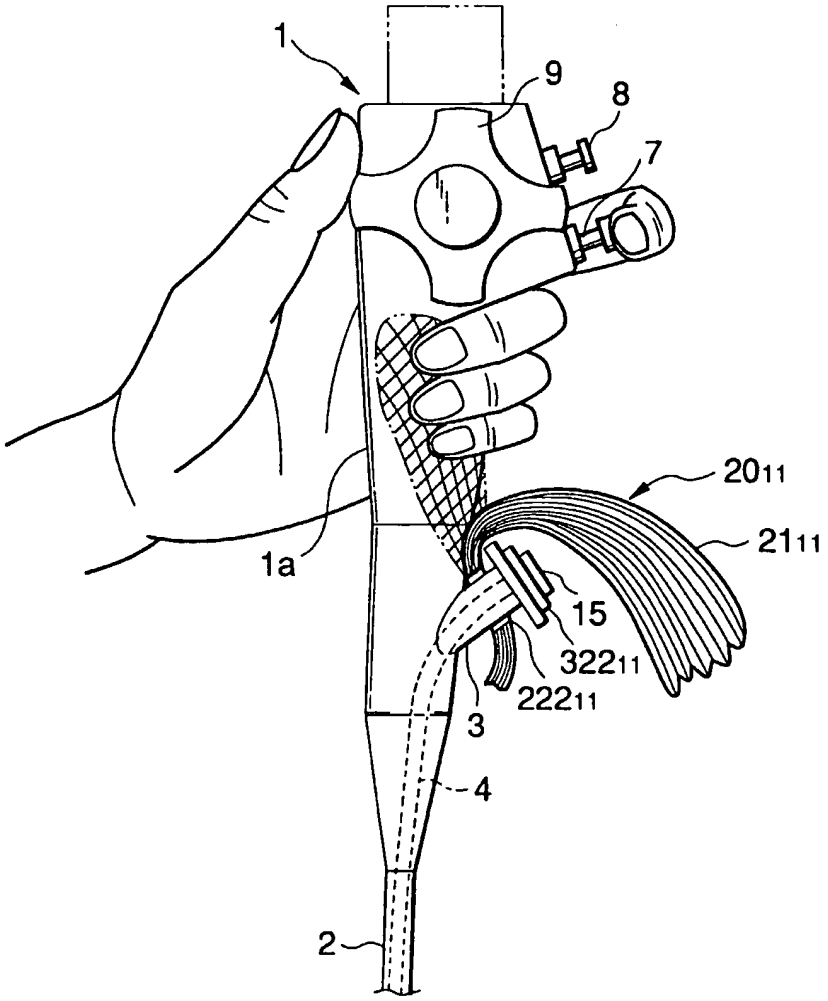


FIG.31

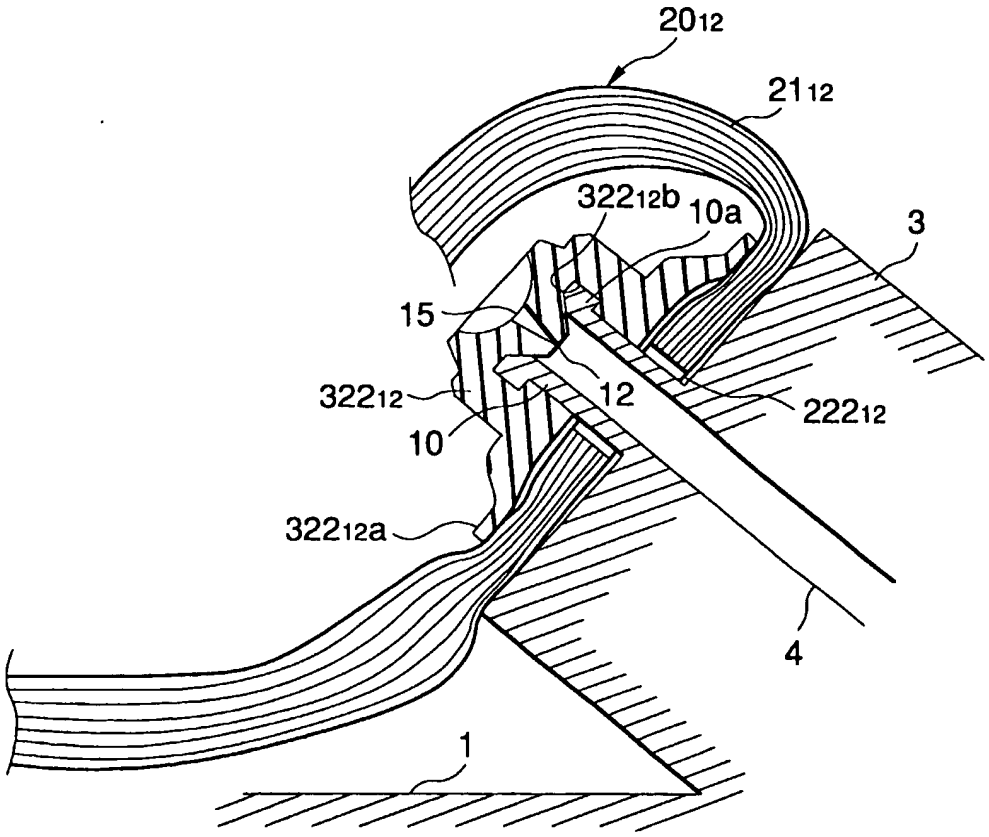


FIG.32

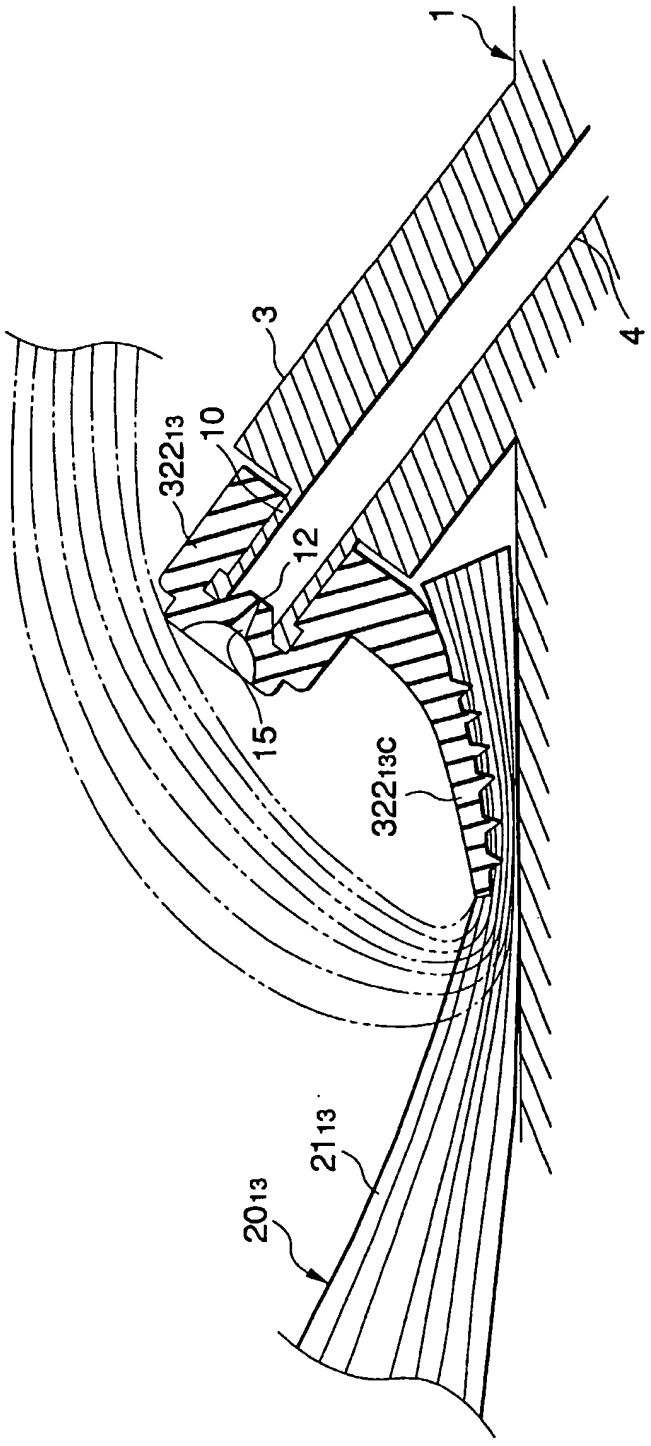


FIG.33

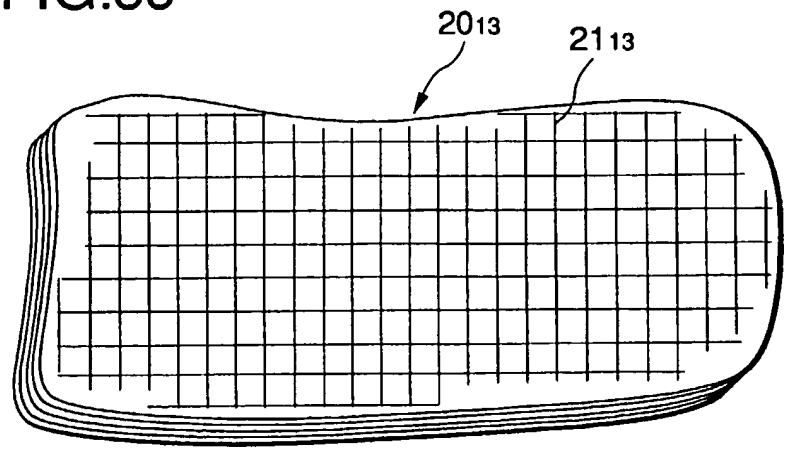


FIG.34

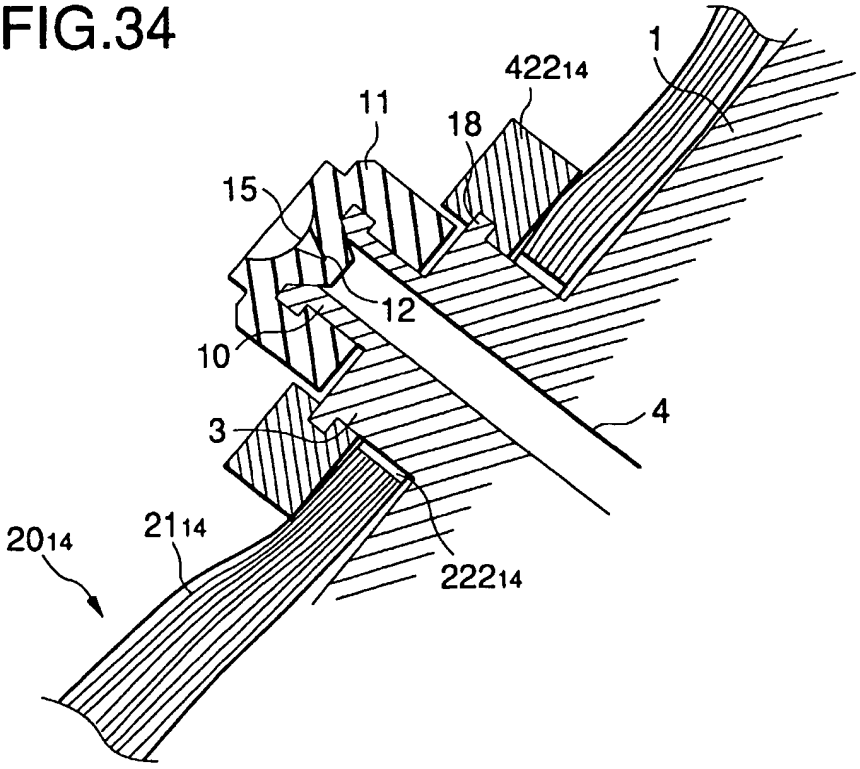


FIG.35

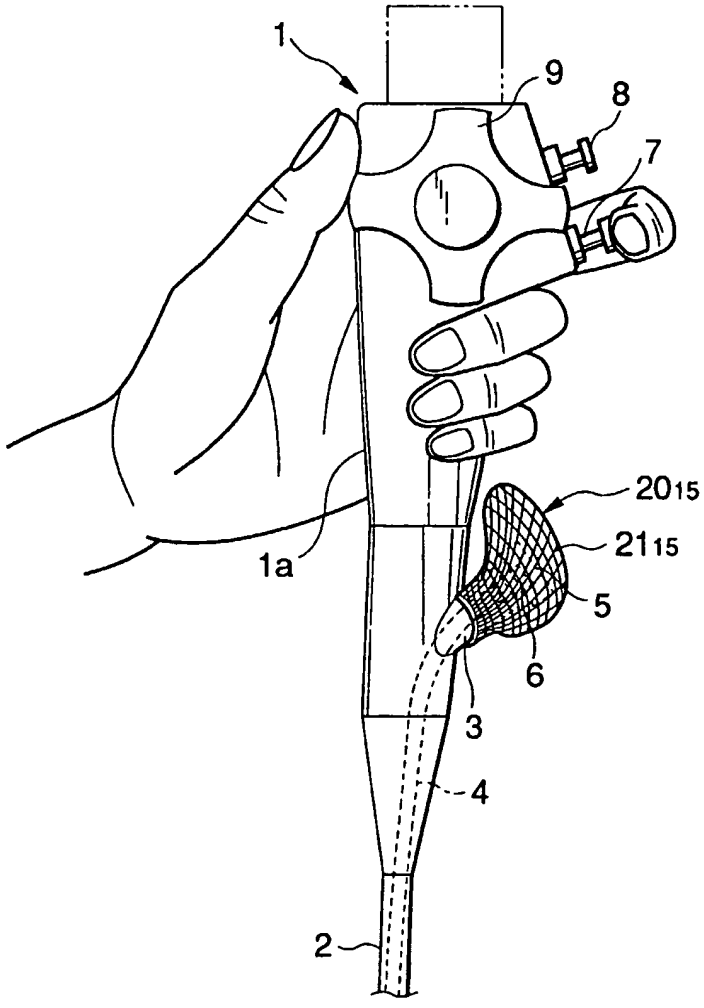


FIG.36

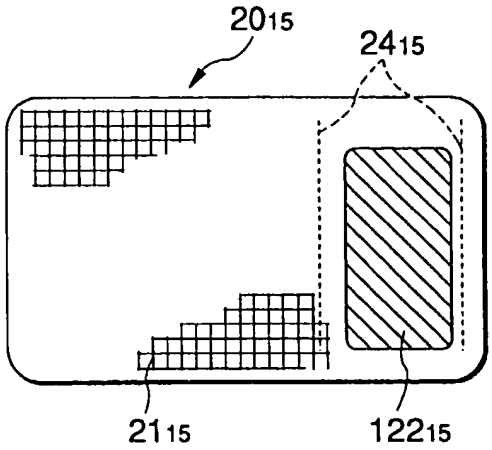


FIG.37

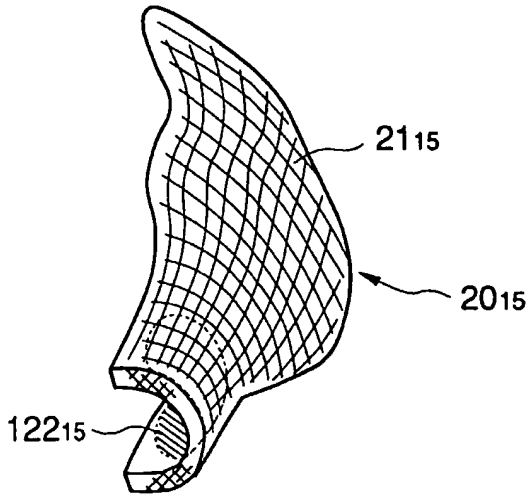


FIG.38

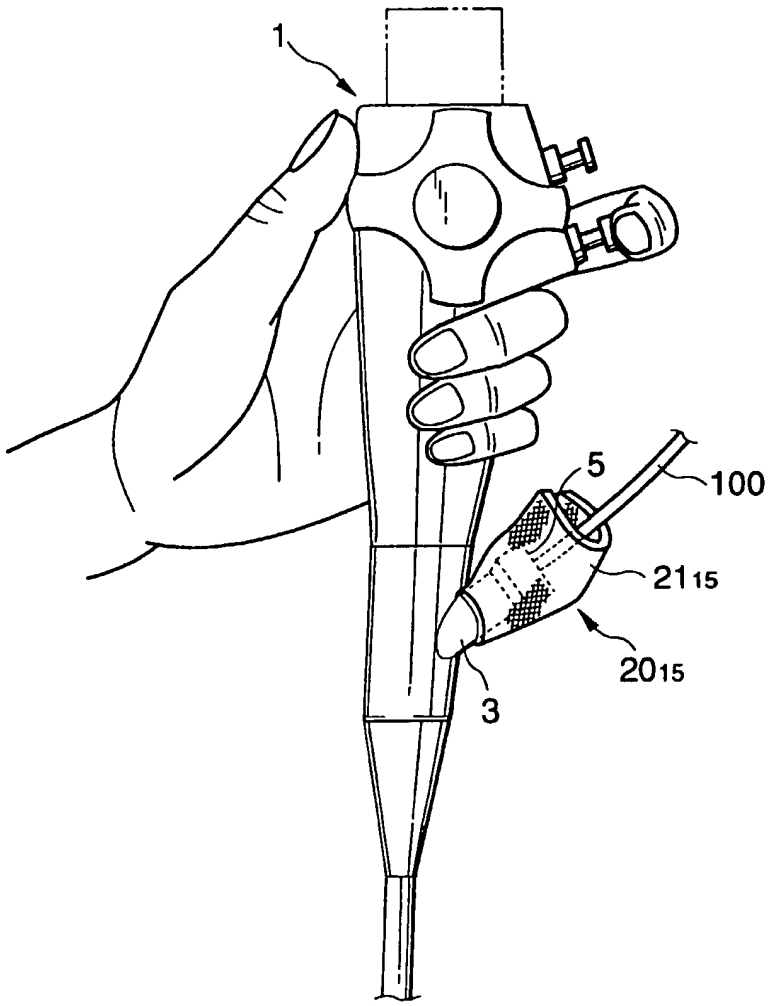


FIG.39

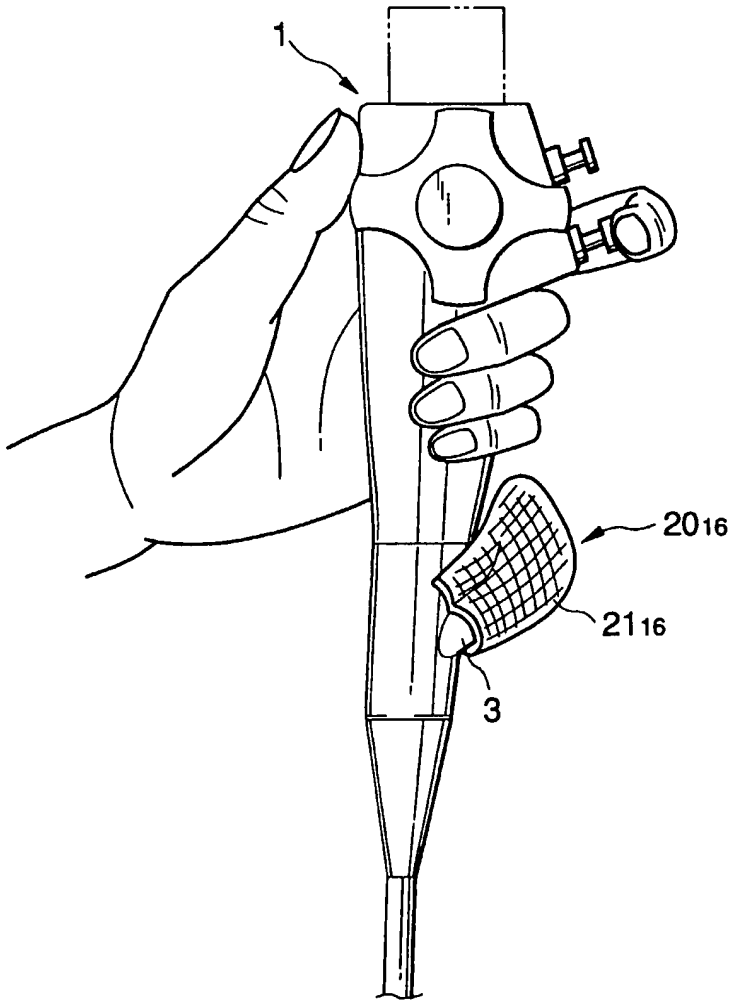


FIG.40

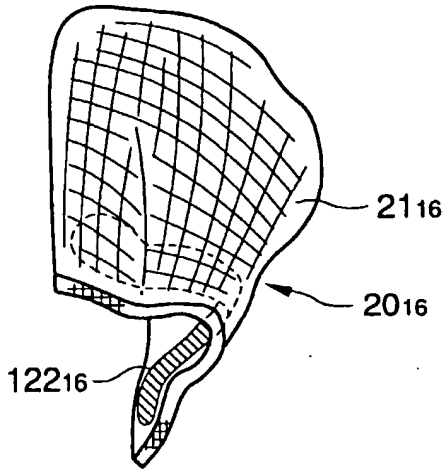


FIG.41

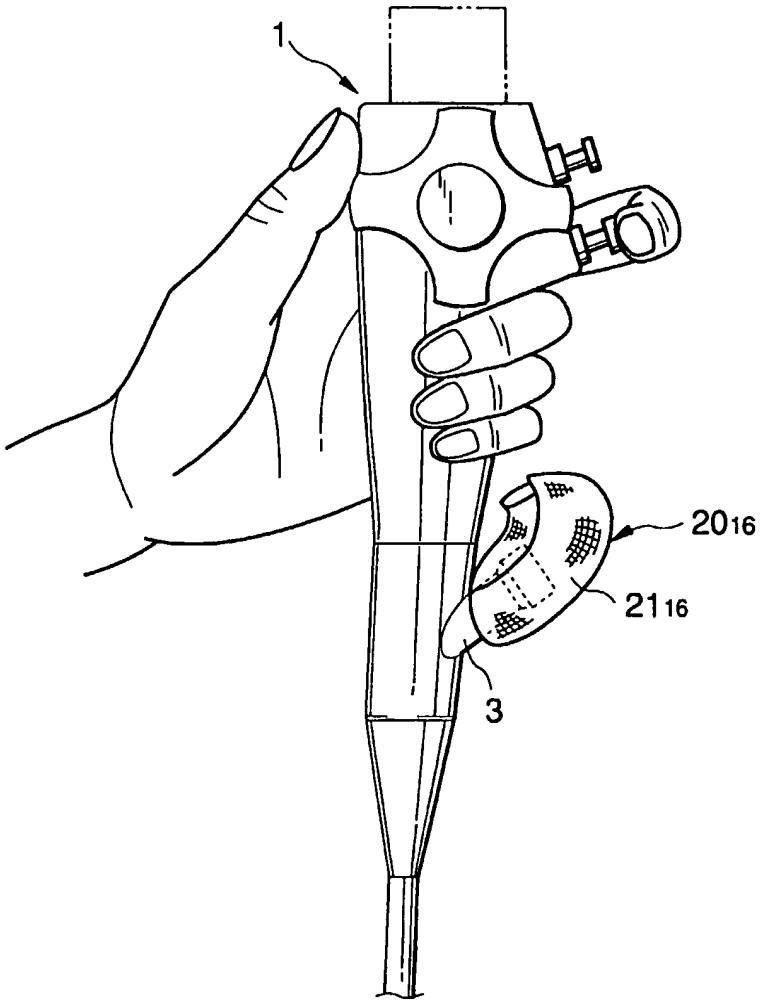


FIG.42

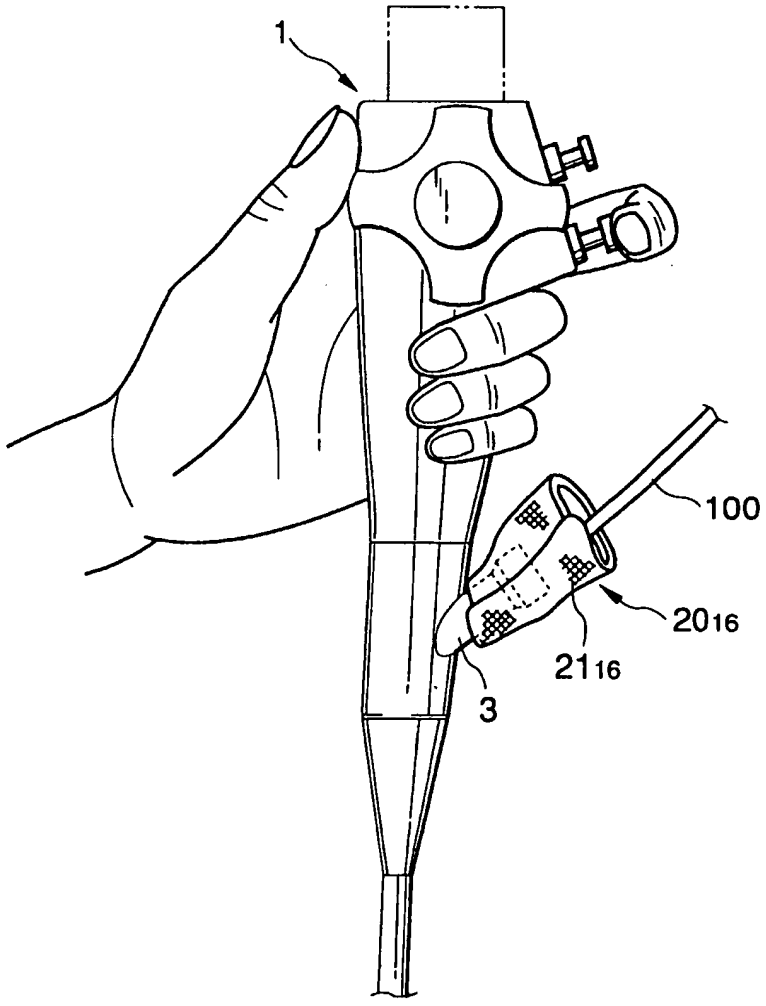


FIG.43

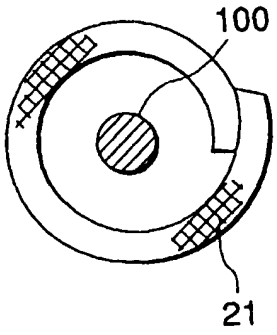


FIG.44

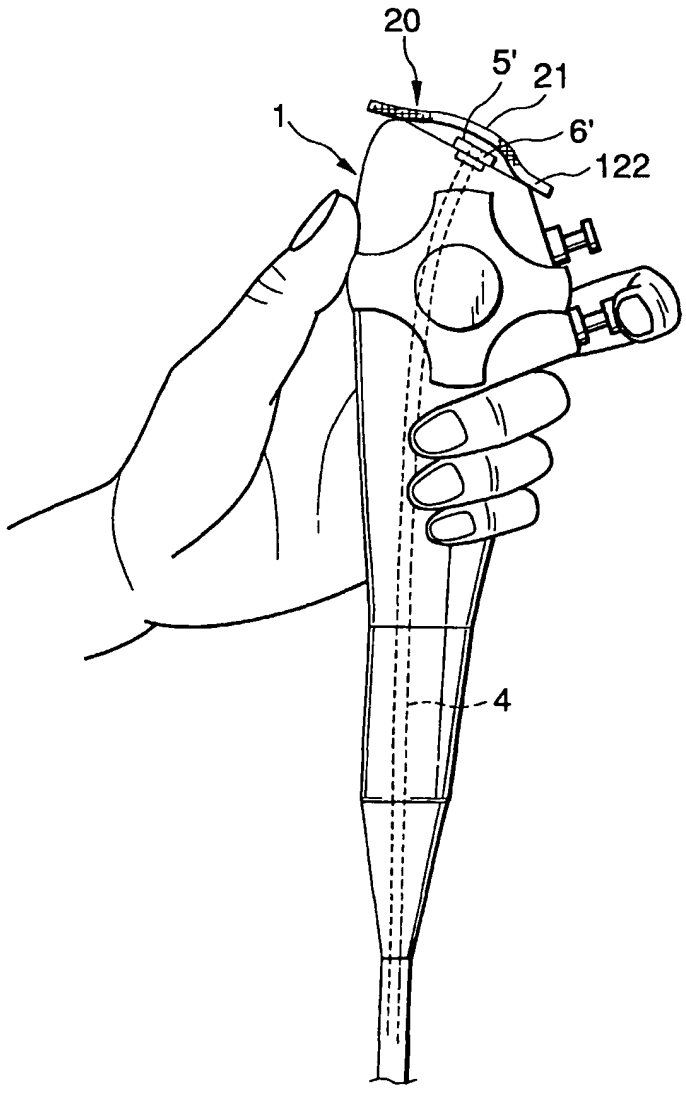


FIG.45

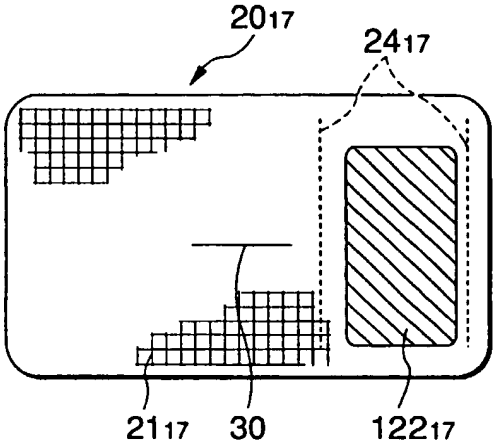


FIG.46

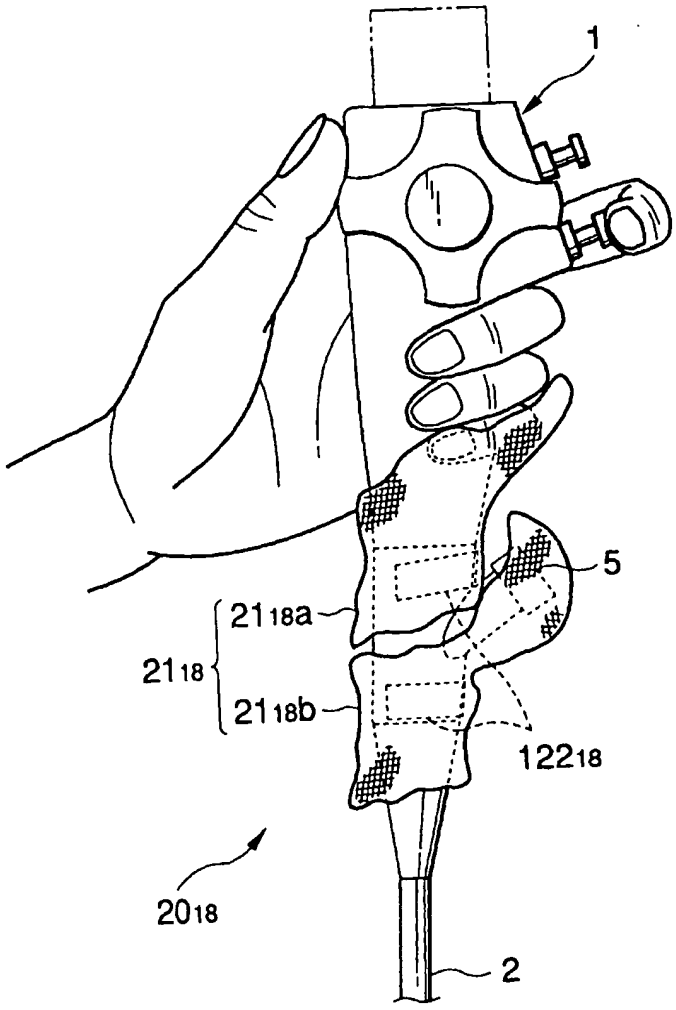


FIG.47

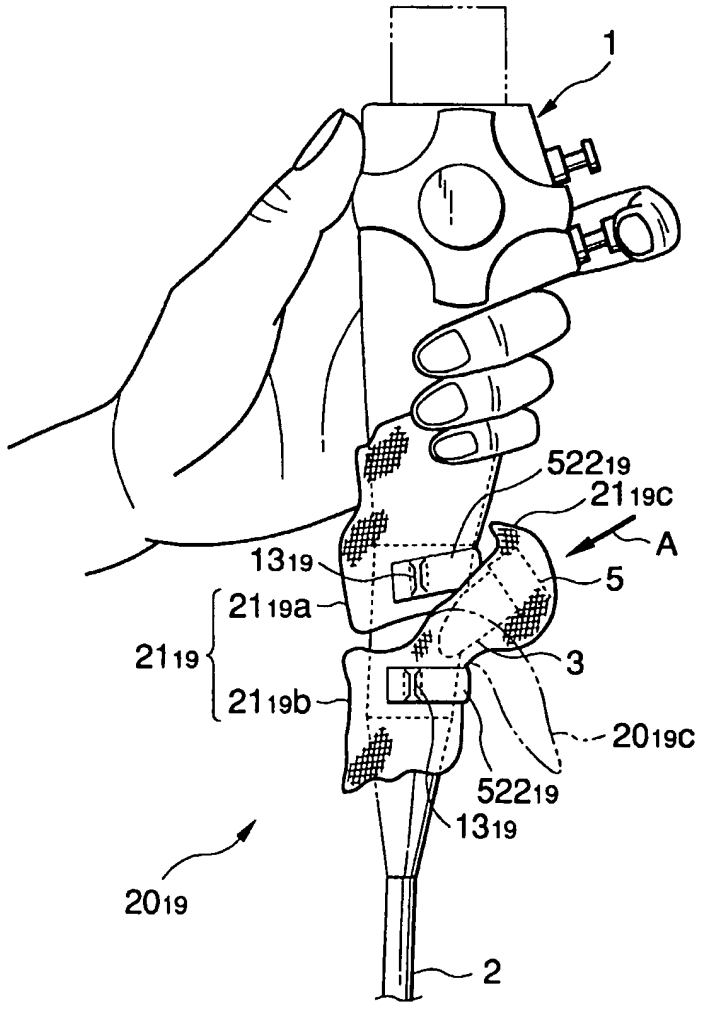

1
$52_{2_{19}}$
21_{19C}
A
13_{19}
5
21_{19a}
21_{19}
3
21_{19b}
20_{19C}
$52_{2_{19}}$
13_{19}
20_{19}
2

FIG.48

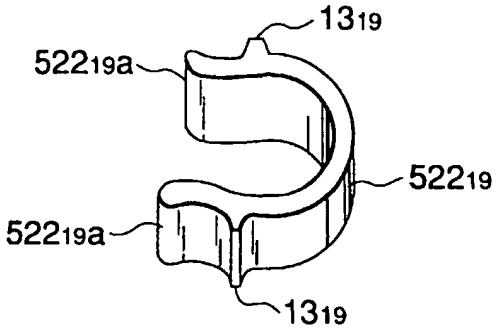

1319
52219a
52219
52219a
1319

FIG.49

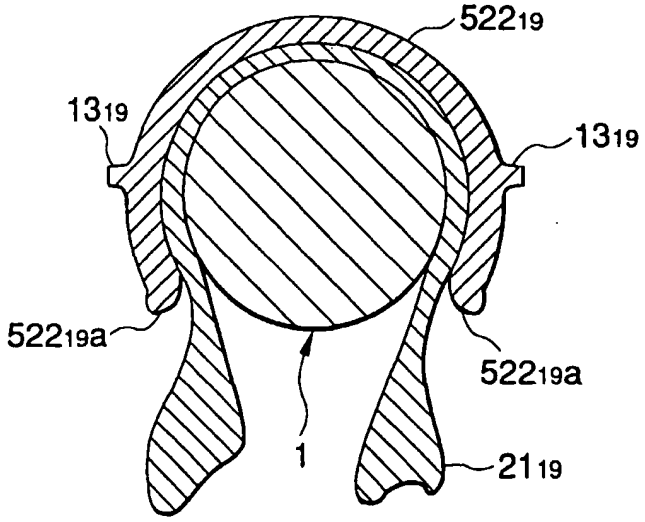

52219
1319
1319
52219a
52219a
1
2119

FIG.50

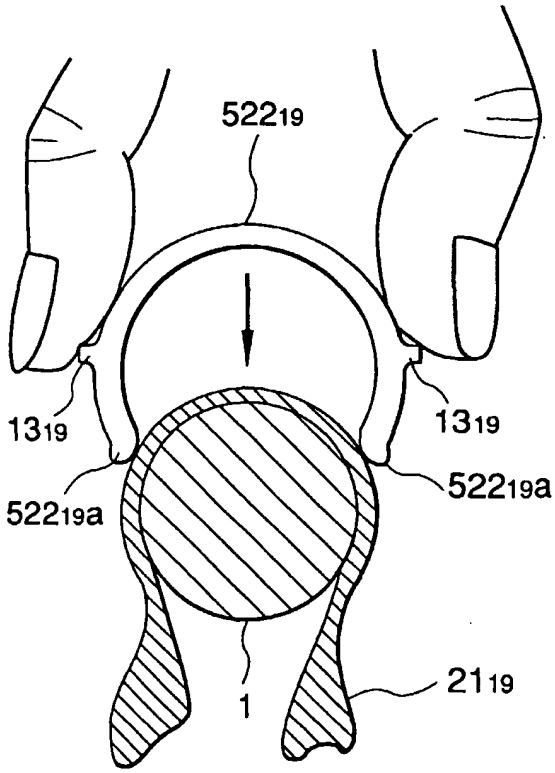


FIG.51

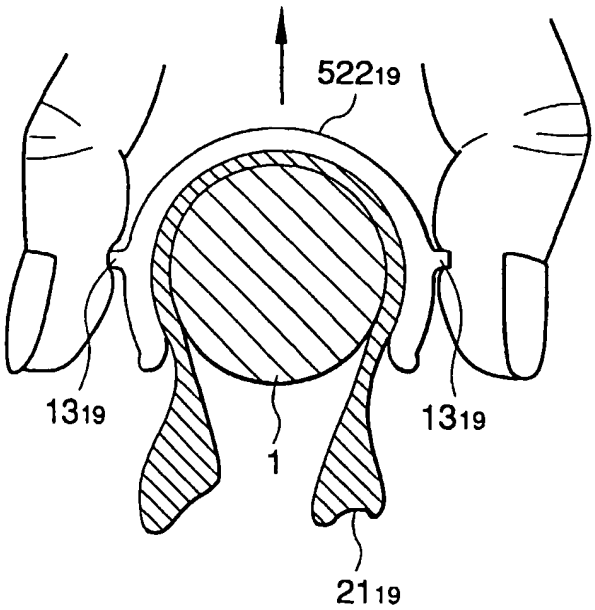


FIG.52

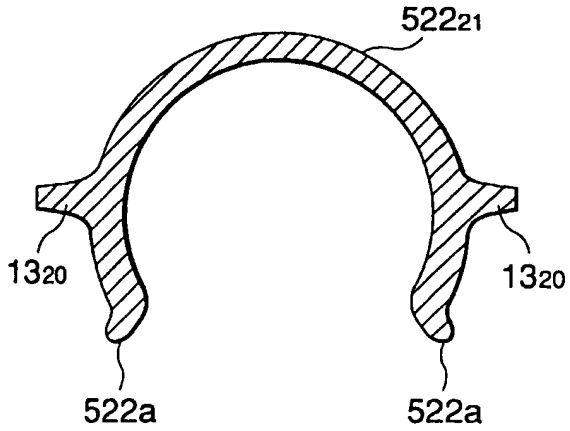


FIG.53

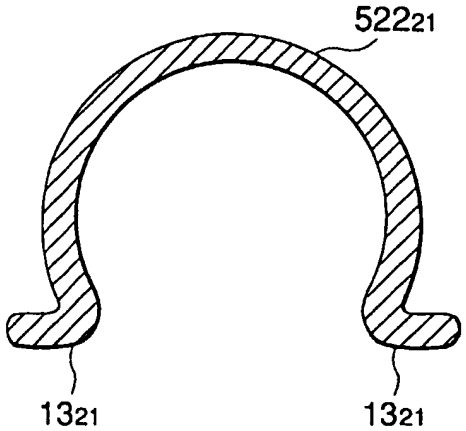


FIG.54

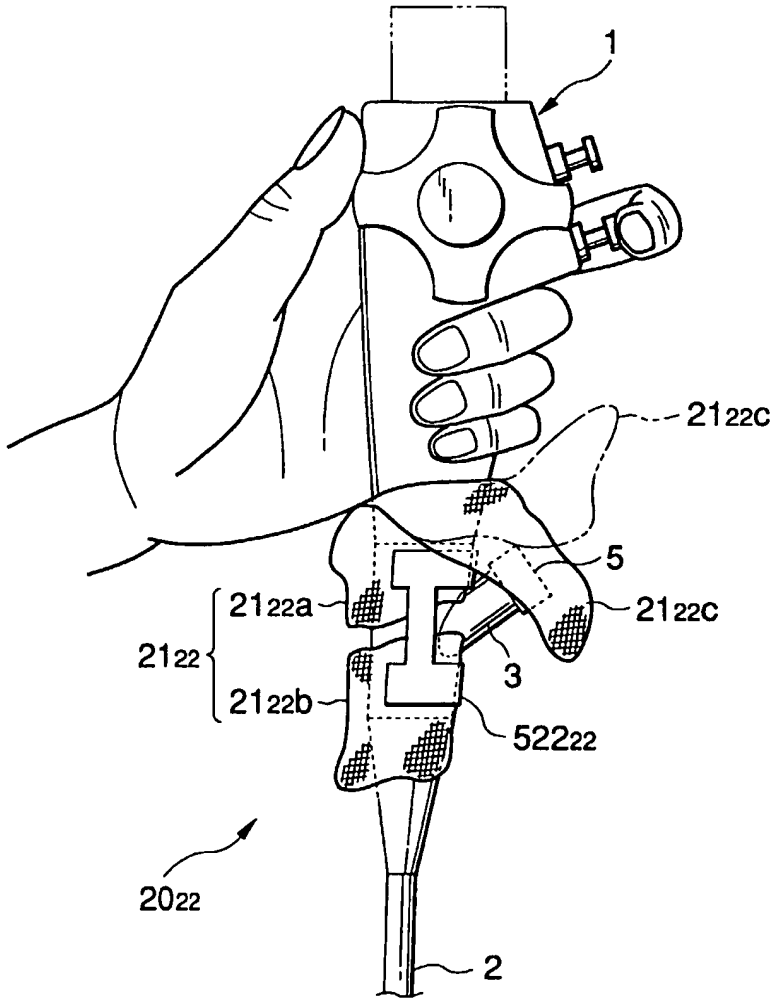


FIG.55

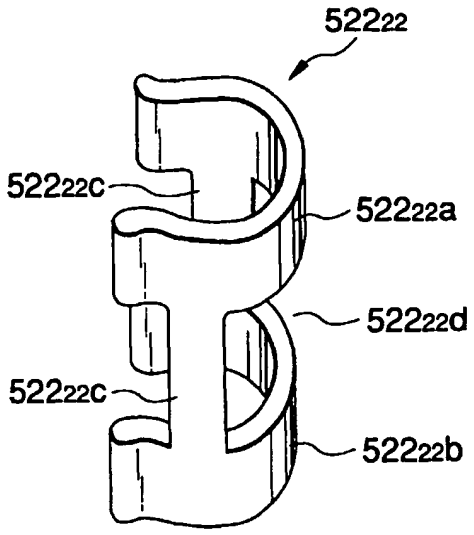

522222
522222c
522222a
522222d
522222c
522222b

FIG.56

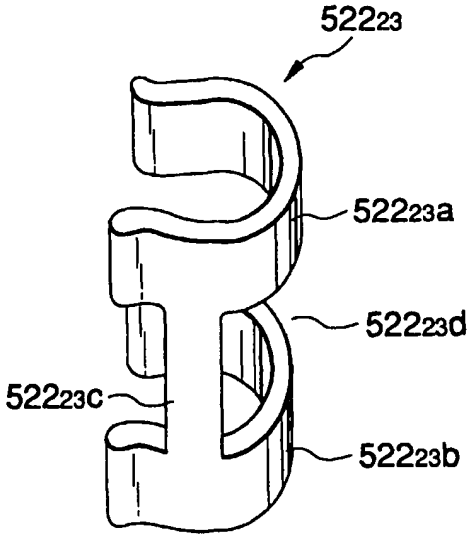

522223
522223a
522223d
522223c
522223b

FIG.57

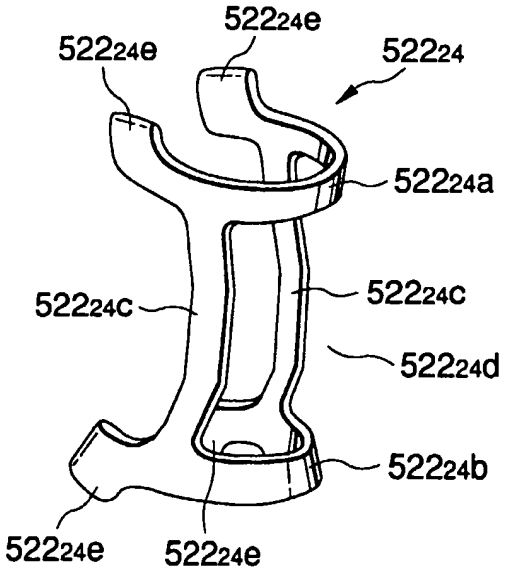

522224e
522224e
522224
522224a
522224c
522224c
522224d
522224b
522224e
522224e

FIG.58

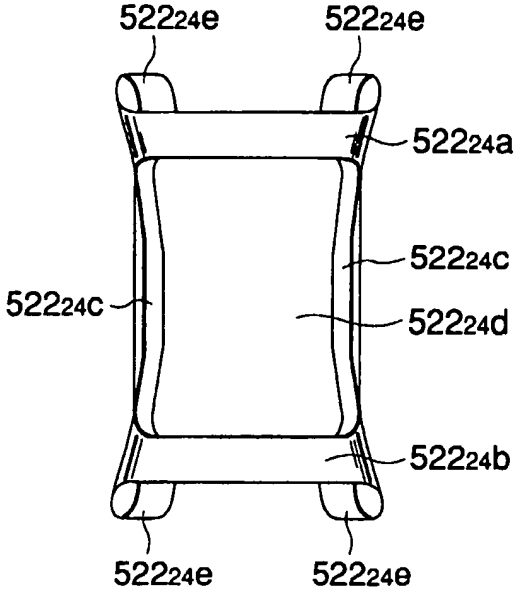

522224e
522224e
522224a
522224c
522224c
522224d
522224b
522224e
522224e

FIG.59

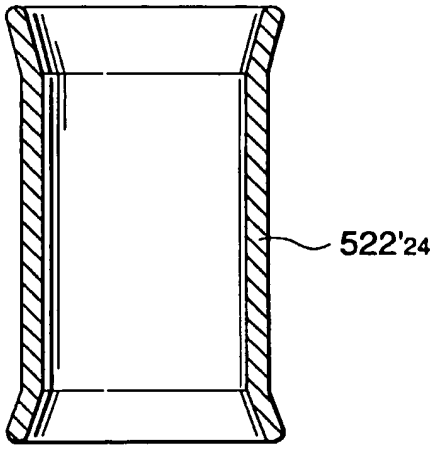


FIG.60

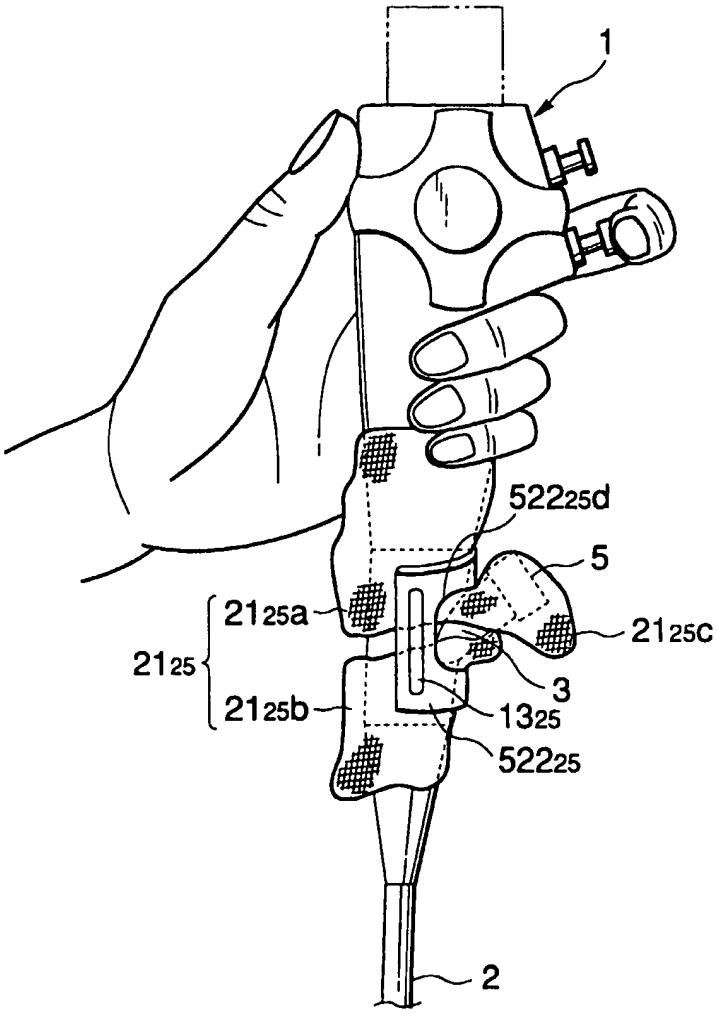


FIG.61

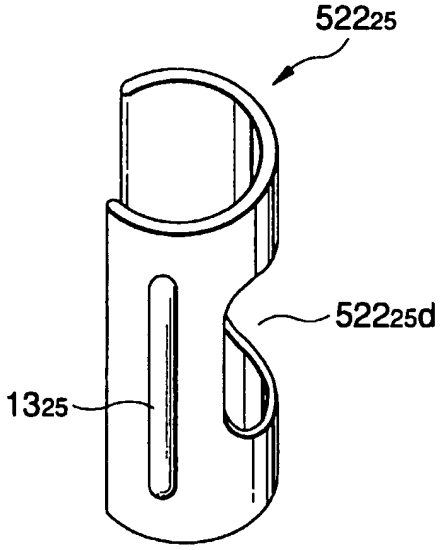


FIG.62

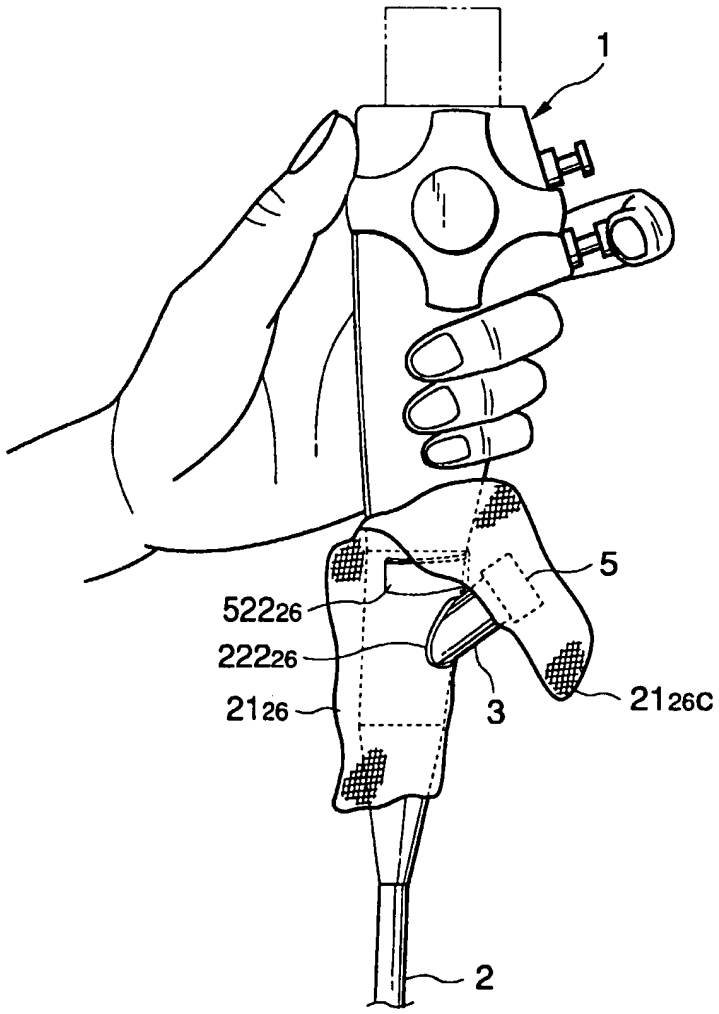


FIG.63

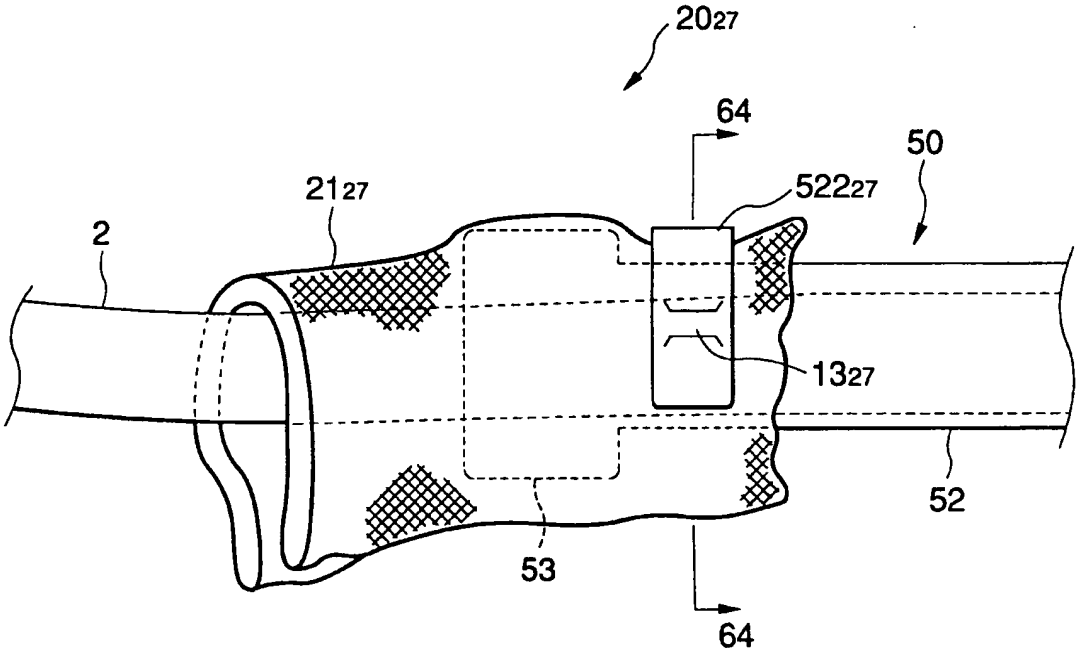


FIG.64

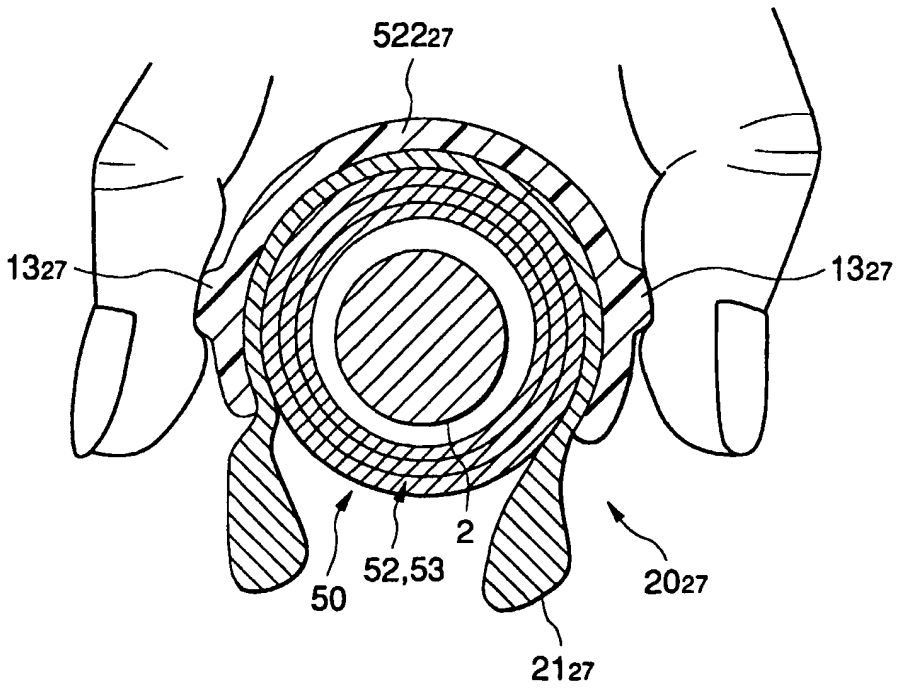


FIG.65

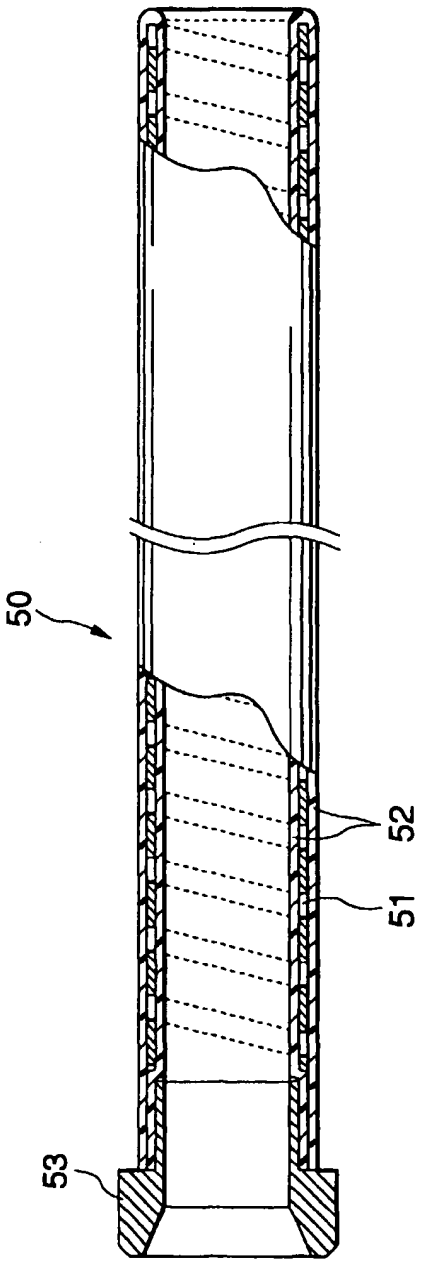


FIG.66

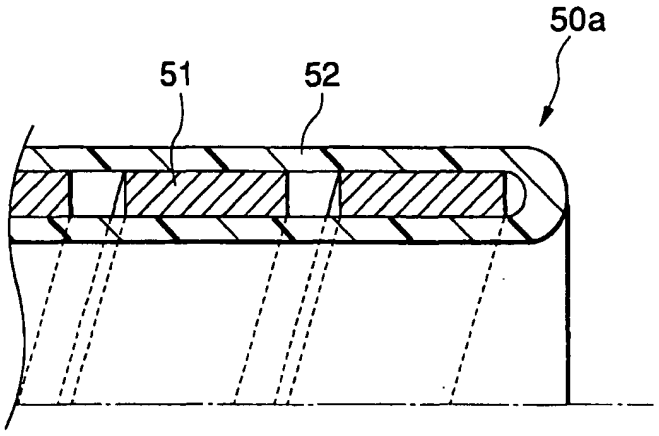


FIG.67

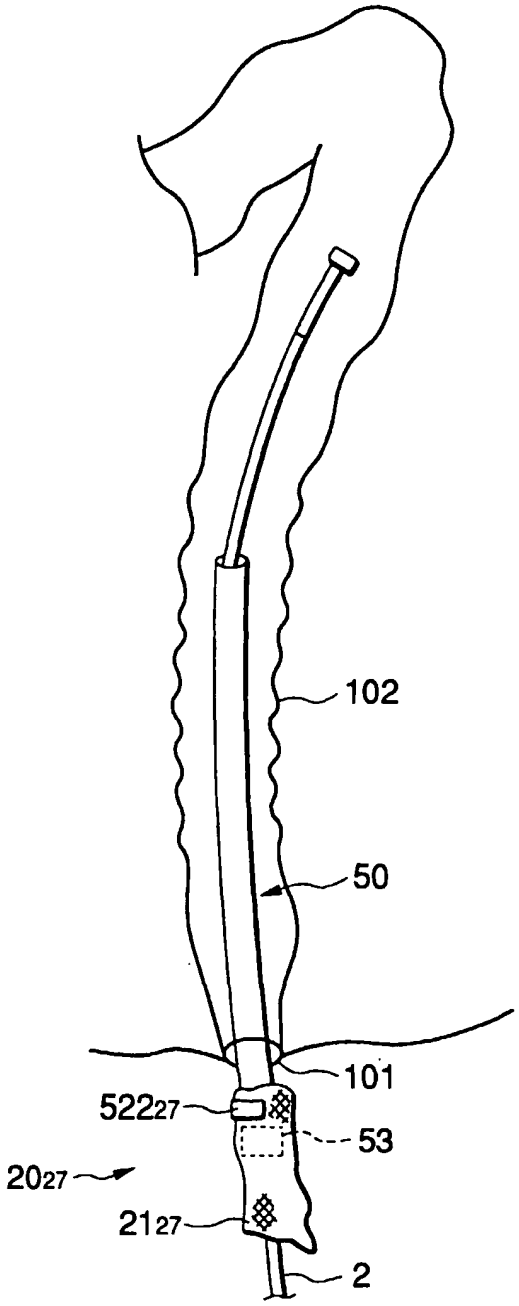


FIG.68

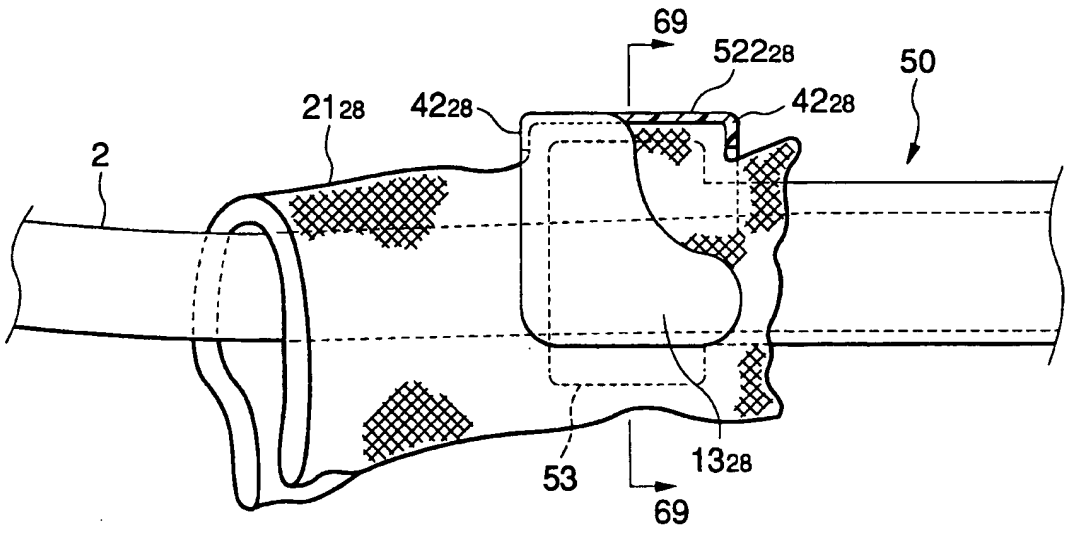


FIG.69

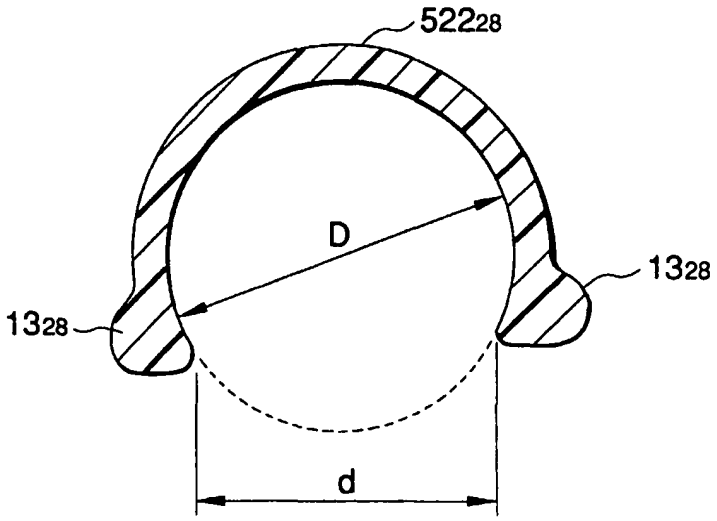


FIG.70

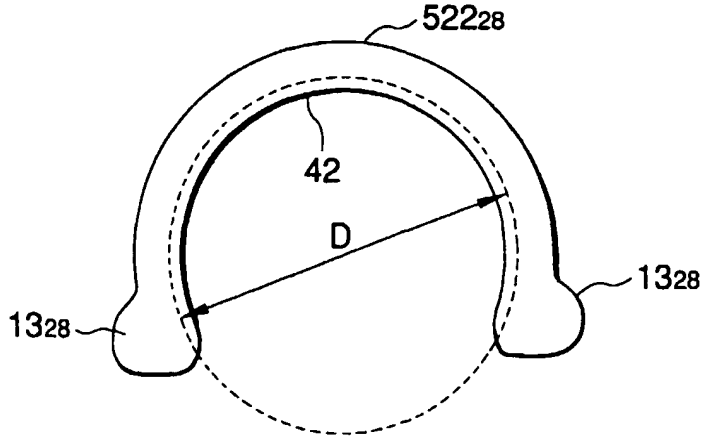


FIG.71

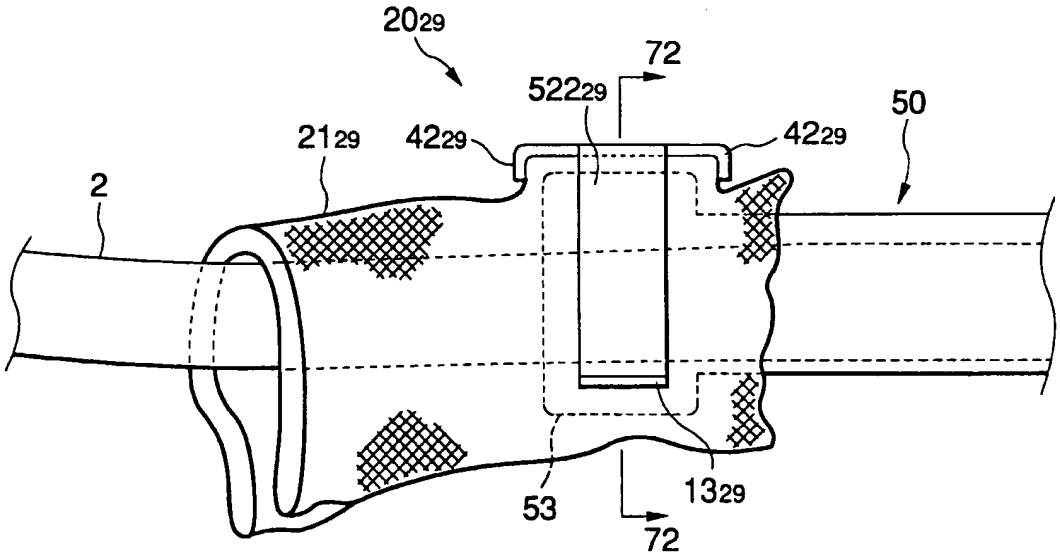


FIG.72

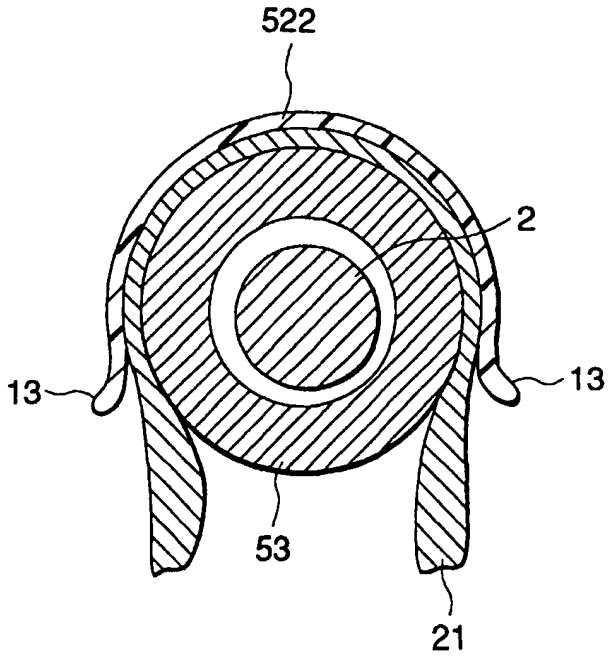


FIG.73

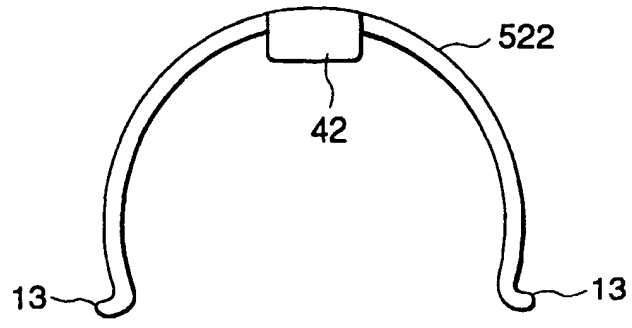


FIG.74

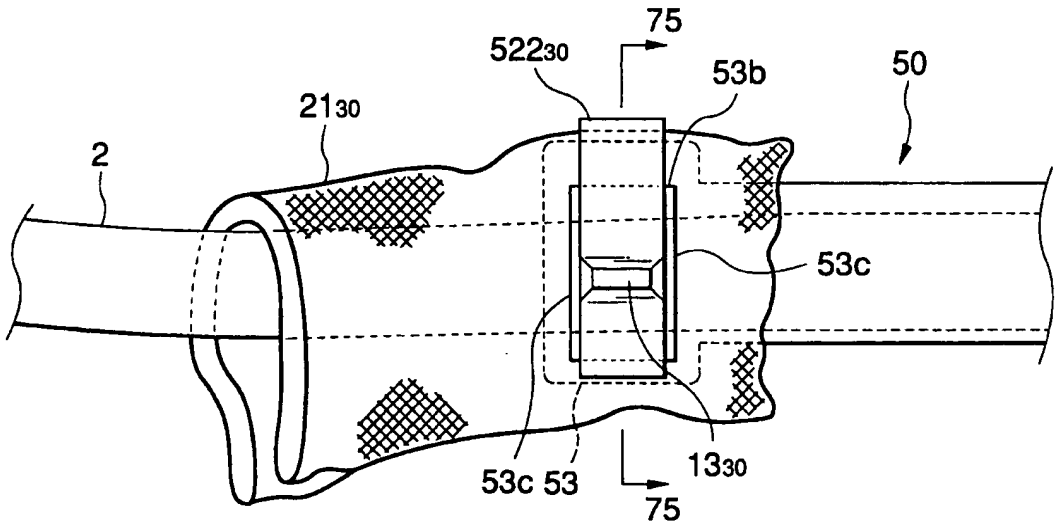


FIG.75

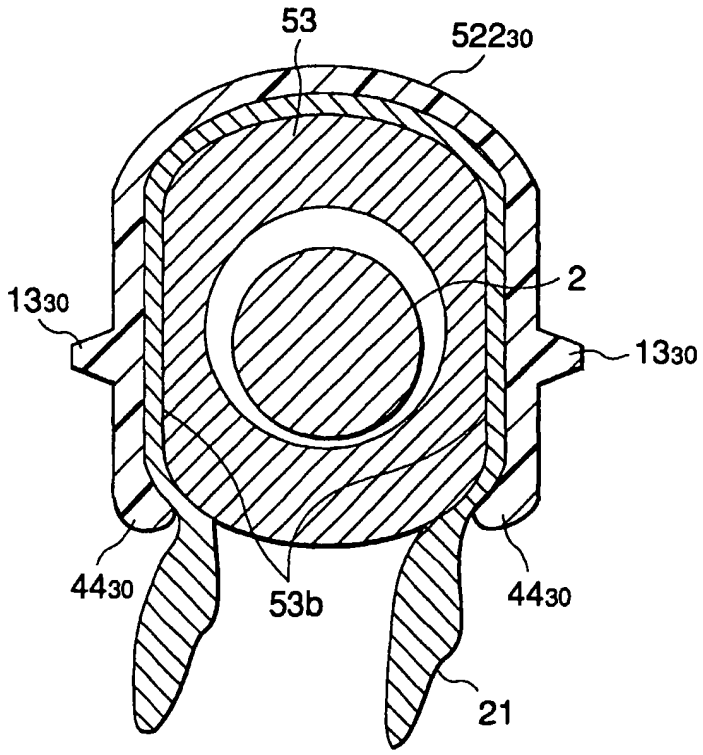


FIG.76

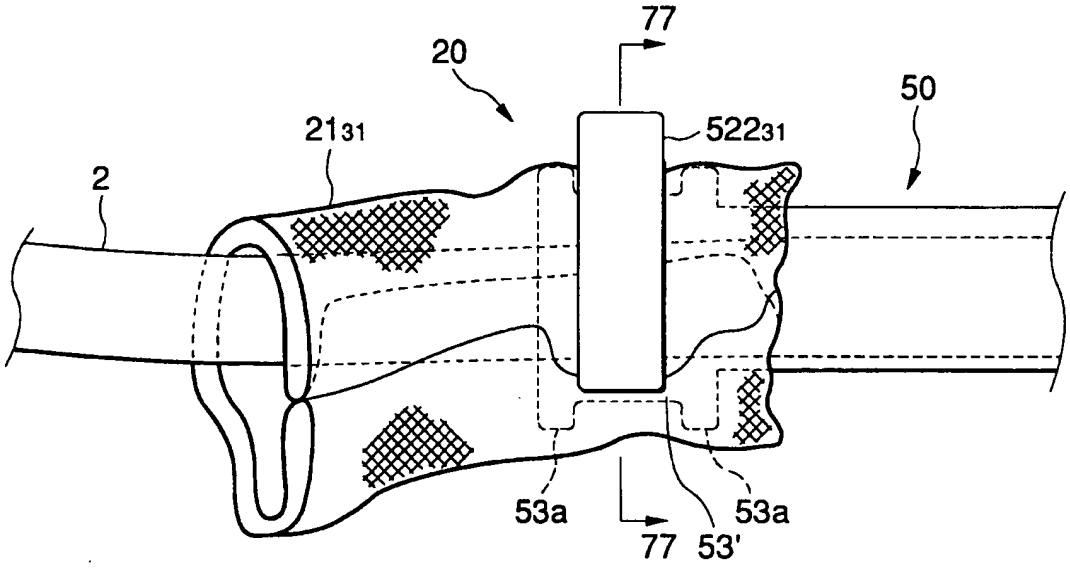


FIG.77

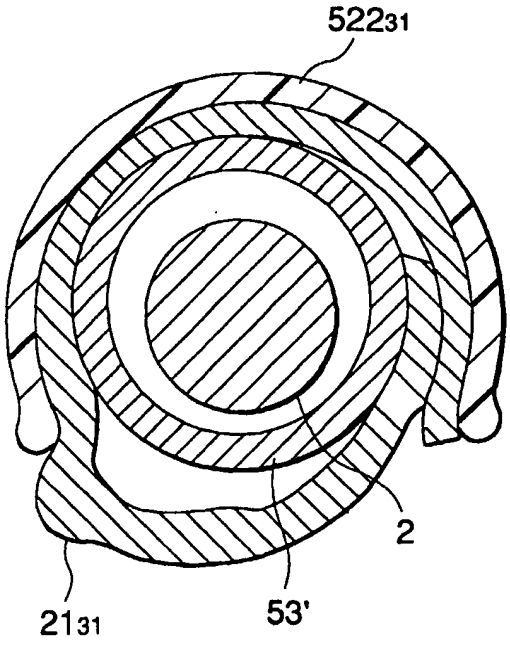


FIG.78

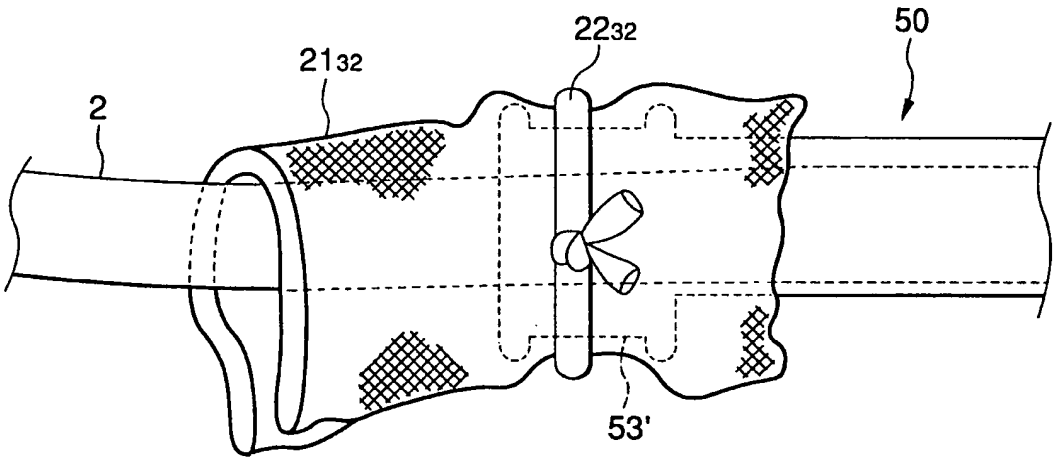


FIG.79

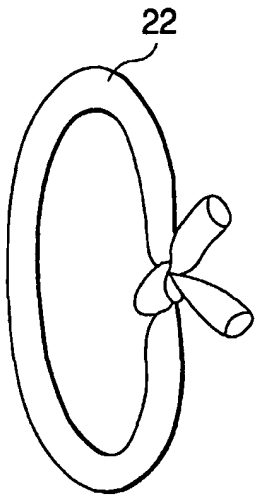


FIG.80

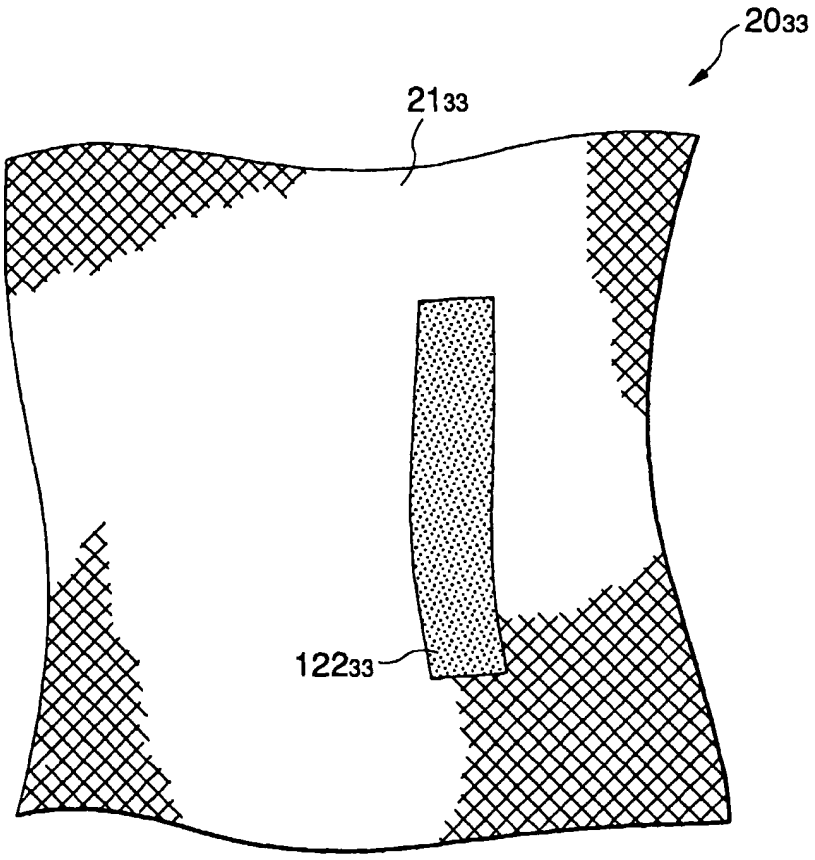


FIG.81

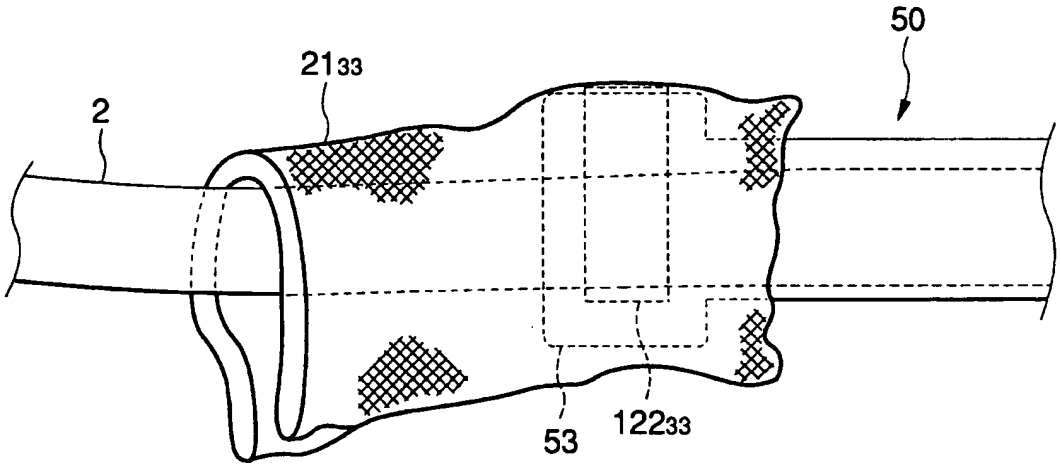


FIG.82

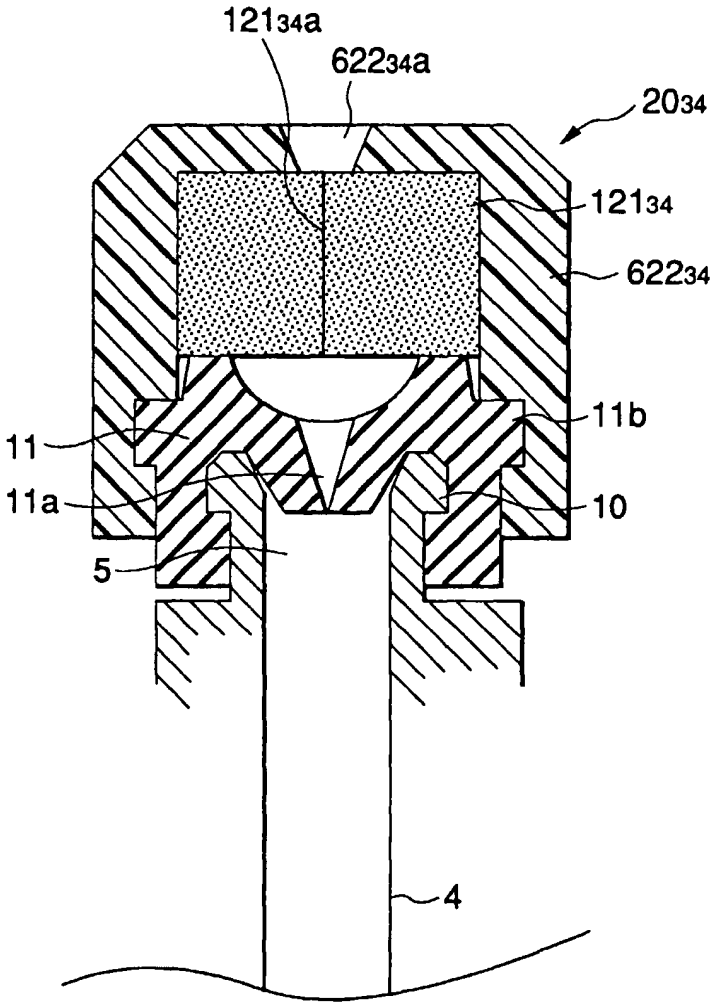


FIG.83

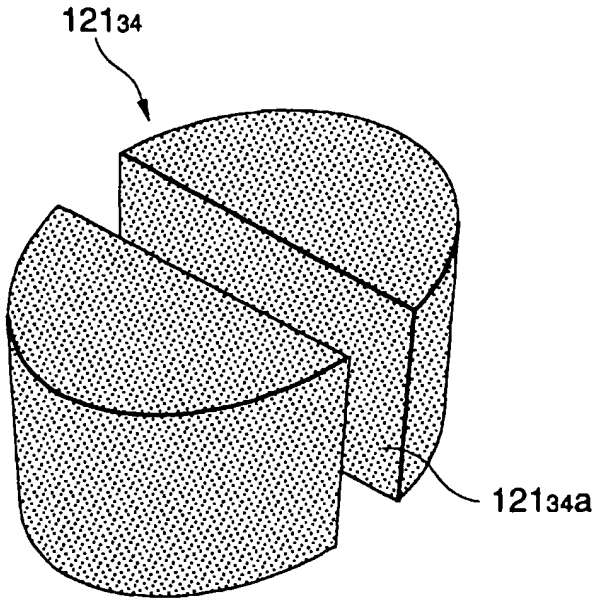


FIG.84

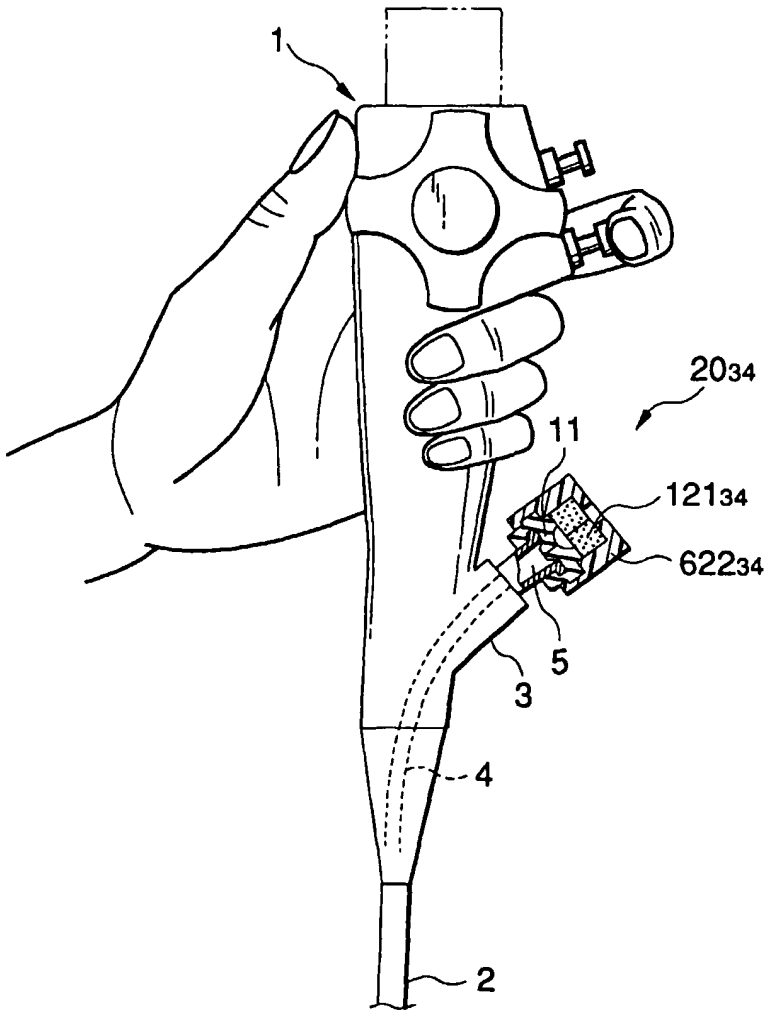


FIG.85

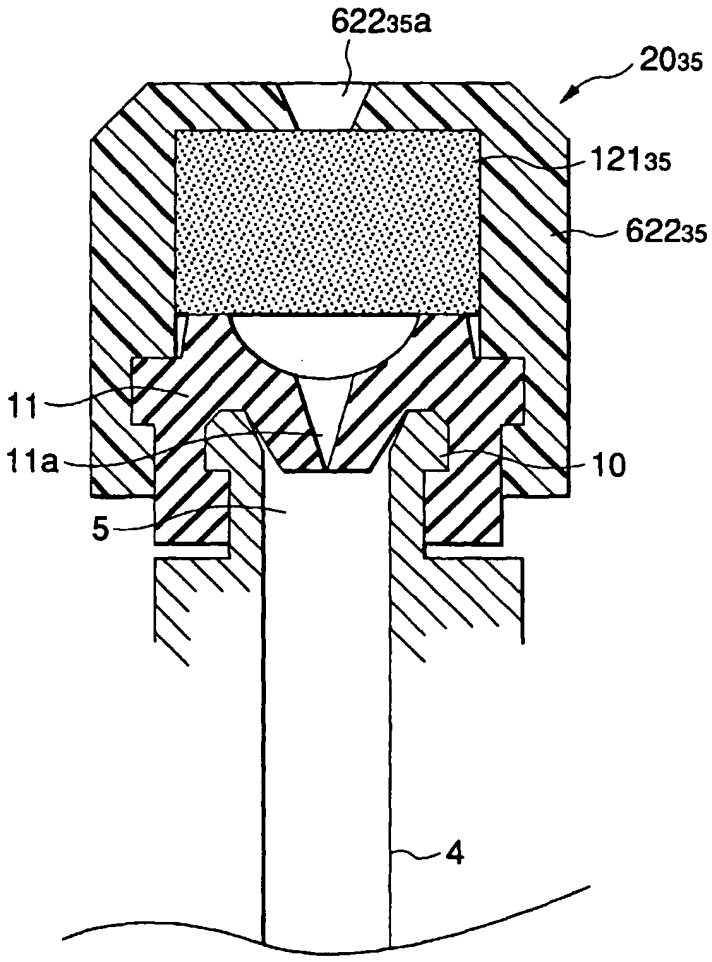


FIG.86

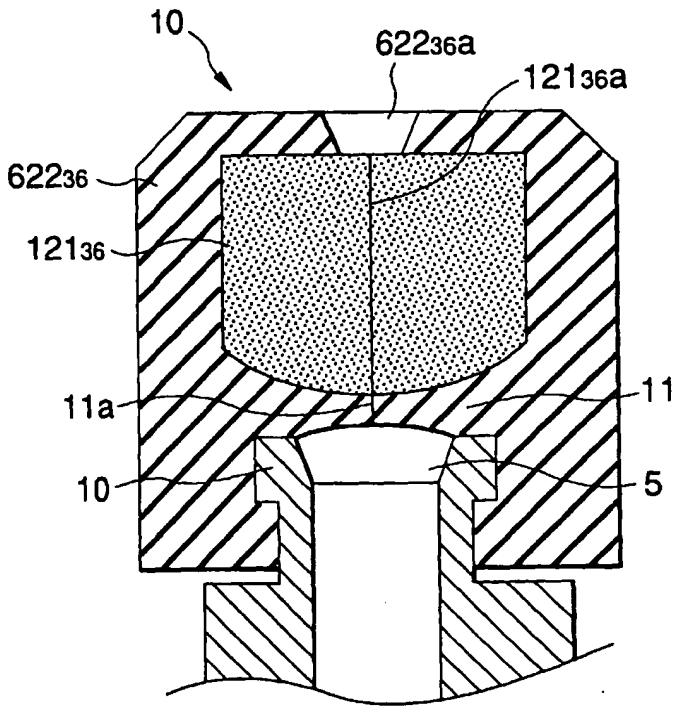


FIG.87

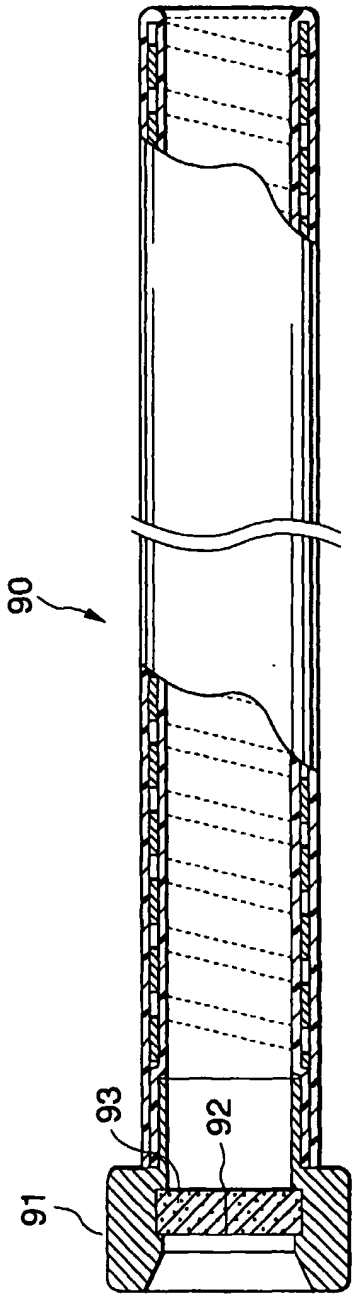


FIG.88

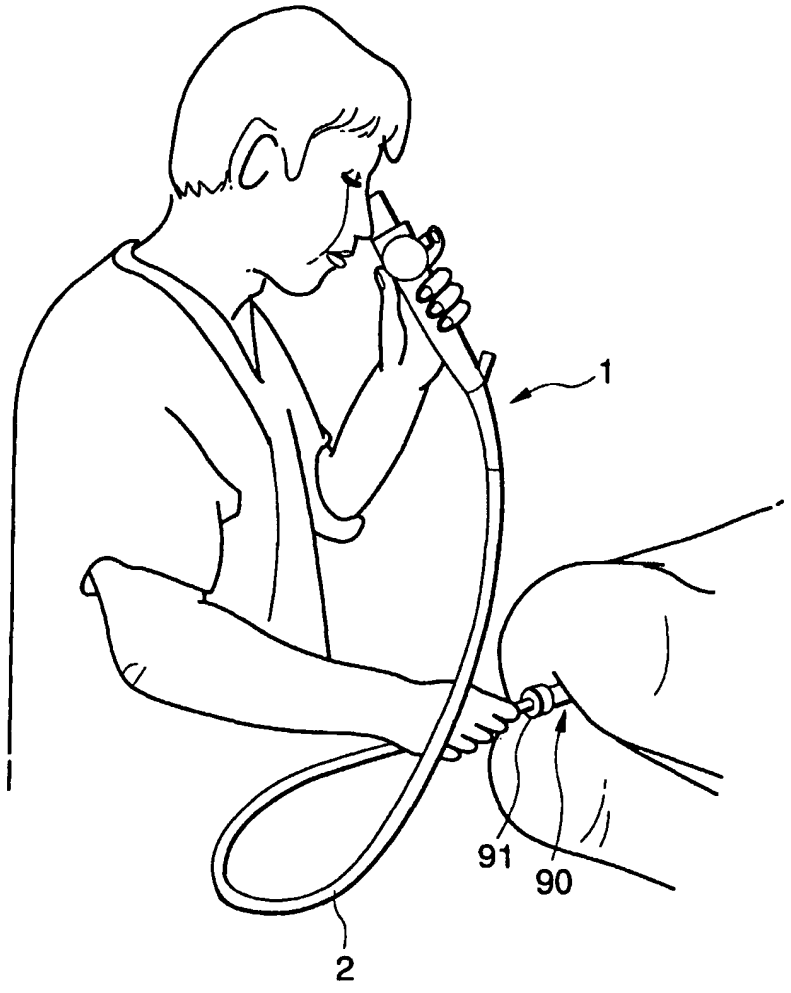
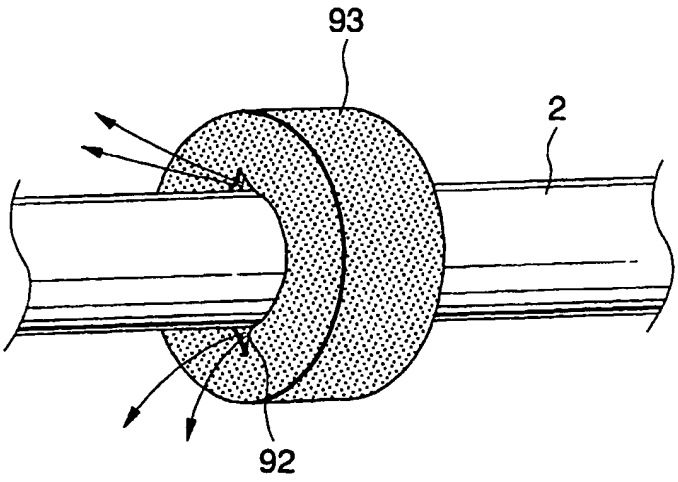


FIG.89



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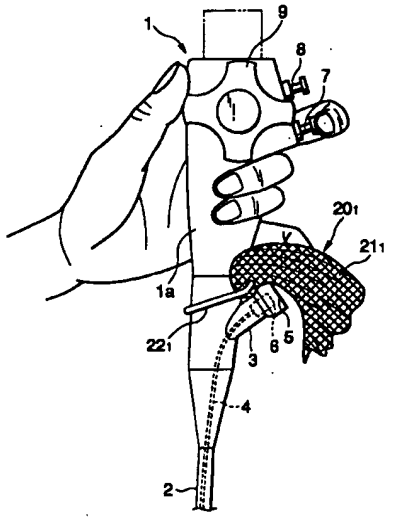
(54) Fluid splashing preventive device

(57) The invention concerns a foul fluid splashing prevention device for an endoscope, which prevents foul fluids inside the body cavity from splashing even when they spray out from a manipulating part side of the endoscope. The foul fluid splashing prevention device includes a foul fluid absorbing member made of flexible water-absorbing material for absorbing the foul fluids that leak out of an external opening of the endoscope. The splashing prevention device further includes a retaining member, which is detachably disposed at the manipulating part to retain the foul fluid absorbing member in the condition where the foul fluid absorbing member covers the external opening.

FIG.1



EP 0 827 712 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y A	US 5 359 991 A (TAKAHASHI NAGASHIGE ET AL) * column 3, line 26 - column 10, line 40; tables 1-21 *	1,11,30 2-4,7,9, 12,14, 16,17, 24,31,36	A61B1/12 A61B1/00
Y A	DE 88 09 674 U (FRESENIUS AG) * page 6, line 9 - line 31 * * page 8, line 4 - line 14; tables 1,2 *	1,11,30 8,38	
A	US 5 363 843 A (YOUSEF DANESHVAR) * column 1, line 51 - column 2, line 7 *	1,11,30	
A	US 4 834 068 A (J.E.GOTTESMAN) * column 3, line 41 - column 4, line 18; table 1 *	1	
A	DE 32 33 564 A (FUJI PHOTO OPTICAL CO.) * abstract * * page 7, line 5 - line 25; tables 1,2 *	30	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A61B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	19 January 1998	Weihs, J

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